DEPARTMENT OF ADMINISTRATION
INFORMATION SERVICES DIVISION

STAN STEPHENS, GOVERNOR

ROOM 22, MITCHELL BUILDING

STATE OF MONTANA

(406) 444-2700

HELENA, MONTANA 59620

TO: All Agency Data Processing Managers

FROM: Mike Trevor, Administrator

DATE: September 26, 1989

SUBJECT: ISD's Standards Project and the Manual of Standards

The Information Services Division has begun the task of updating the ISD Manual of Standards. A **Working Draft** of the manual is attached for your review. The format has changed substantially from past manuals and is explained in the attached preface. Policies contained here were obtained from the Montana Operations Manual and some new policies added to address matters not previously covered.

I suggest that you review the preface materials before proceeding in reviewing the standards. Please contact ISD's Resource Management Unit if you have any questions regarding the manual.

The ISD Manual of Standards will be published and formally distributed on May 1, 1990. In the interim we solicit your comments on the format and content of this Working Draft. Please submit them to the Resource Management Unit no later than March 2, 1990.

Thank you for your assistance.

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STATE OF MONTANA
DEPARTMENT OF ADMINISTRATION

# A WORKING DRAFT OF THE INFORMATION SERVICES DIVISION'S MANUAL OF STANDARDS

September 26, 1989

## PREFACE TO THE ISD MANUAL OF STANDARDS

### Mission Statement

To establish, approve, implement, and/or maintain policies, standards, procedures, and guidelines which provide for a uniform, controlled, efficient, reliable and secure operating environment for Statewide information processing services supported by the Information Services Division.

### Assumptions

1. The intent of the Standards Project is to provide information that will be utilized by the Information Services Division to operate according to its Mission Statement.

2. The scope of the Standards Project will be the Information Services Division's policies, standards, procedures, and guidelines known as the **ISD MANUAL OF STANDARDS.** (Policies, standards, procedures, and guidelines will be collectively referred to as **Standards.**)

### Objectives

1. To establish, develop and maintain Information Services Division policies in a manner consistent with the Department of Administration's direction.

2. To establish, approve, implement and maintain Information Services Division **Standards.**

3. To review and approve Bureau **Standards** to assure adherence to Information Services Division policies.

4. To provide an environment which allows management to reasonably assure users that information processing services will be carried out in a standardized, effective, reliable and secure manner.

5. To promote flexibility through the development, establishment and maintenance of **Standards** which will allow reasonable discretionary powers to individual operating units within the Division and within State government.

6. To establish, approve, implement and maintain **Standards** which allow adherence to accepted and approved security practices and statutory requirements.

## GUIDELINES FOR STANDARDS DOCUMENTATION

1. Distinguish between policies, standards, procedures, and guidelines in technical descriptions.

2. State all policies first.

3. Make it simple.

4. Plan out a lengthy draft arranging material into a hierarchy of topics. Give each topic a meaningful heading.

5. Use as few words as possible to maintain clarity and readability in the text.

6. Plan ahead and develop **Standards** that will be needed at some point in the future.

## DEFINITIONS

**POLICY** ------- A statement of management philosophy on a general principle or the attainment of a long-term, agency-wide objective.

**STANDARD** ----- A detailed statement to support operating policy. This statement defines responsibilities and relates to specific conditions and practices. A standard identifies what must be done to implement policy.

**PROCEDURE** ---- Detailed statements to implement standards. These statements identify the sequence of events that will be followed. Procedures identify how things will be done.

**GUIDELINE** ---- Detailed statements to support standards and/or procedures. These statements identify the recommended sequence of events that may be followed.

**BULLETIN** ----- A document containing urgent **Standards** information that warrants publishing and distribution outside of the normal **Standards** development and publication process.

**EXCEPTION** ---- Written approval for a task to be done in a manner that deviates from a standard or procedure.

**VIOLATION** ---- An unauthorized break from a standard or procedure.

**ENFORCEMENT** -- A defined means of ensuring conformance with standards and procedures, and a way of maintaining control over exceptions.

**AUDIENCE** ----- Defined groups of recipients of **Standards** documentation. Each group will have similar informational needs based on their functional responsibilities.

**APPENDIX** ----- A collection of supplemental data or information that supports a set of **Standards**. Appendices may be used to provide one source for topics that are referenced more than once or to isolate a list of items that require periodic changes.

## RULES AND PROCEDURES

In order to implement meaningful **Standards** in a timely and efficient manner, the following methods will be used:

### Policies:

1. Policies will be established or revised by the Information Services Division management.

2. All policies will require the Division Administrator's approval.

### Standards:

1. Standards will be established or revised by Information Services Division management.

2. All standards will require the Bureau Chief's approval.

3. Standards that cross Bureau lines must be approved by the respective Bureau Chiefs.

4. Proposed standards must support an approved policy.

### Procedures:

1. Procedures will be established or revised by Information Services Division management or their designated representatives.

2. All procedures will require the Bureau Chief's approval.

3. Procedures that cross Bureau lines must be approved by the respective Bureau Chiefs.

4. Proposed procedures must support an approved standard.

### Guidelines:

1. Guidelines may be proposed by Information Services Division personnel.

2. All guidelines (new or revised) will require the respective Bureau Chief's approval.

3. Guidelines that cross Bureau lines must be approved by the respective Bureau Chiefs.

4. All guidelines must support approved standards and/or procedures.

## SUBMISSION OF POLICIES, STANDARDS, PROCEDURES AND GUIDELINES

1. Proposed or revised policies, standards, procedures and guidelines may be submitted via electronic mail in draft form using WordPerfect format to the Standards Coordinator.

2. Proposed policies, standards, procedures and guidelines will be formatted according to the approved format for each, reviewed and returned to the originator for approval.

3. Revised policies, standards, procedures and guidelines will be reviewed and updated according to the originator's intent, and returned to the originator for approval.

## APPROVAL OF POLICIES, STANDARDS, PROCEDURES AND GUIDELINES

1. Policies, standards, procedures and guidelines shall be submitted to the Information Services Division management for final review and approval prior to implementation.

2. Policies, standards, procedures and guidelines shall be published quarterly.

## DISTRIBUTION OF APPROVED POLICIES, STANDARDS, PROCEDURES AND GUIDELINES

1. An appropriate number of copies of each new or revised policy, standard, procedure or guideline will be provided to each Bureau and upper administrative level in the Information Services Division after it has gone through the approval phase of the project.

2. Each Bureau will be responsible for distributing new or revised policies, standards, procedures and guidelines as required within the Bureau.

3. The Resource Management Unit shall maintain a complete set of all policies, standards, procedures and guidelines for the Information Services Division.

4. The Resource Management Unit shall be responsible for copying and distributing new or revised policies, standards, procedures and guidelines as required to other State agencies.

## TYPOGRAPHICAL LAYOUTS

The typographical layouts for policies, standards, procedures and guidelines are shown in the examples of each on the following pages. The heading for all **Standards** will be:

```
   POLICY:                                    Section
 STANDARD:                                      #:
PROCEDURE:                                      #:
GUIDELINE:                                      #:
                                       PUB. DATE:
                                     REVIEW DATE:
                                            PAGE:      OF
```

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### Policies

The general heading format for ISD's MANUAL OF STANDARDS' Policies is shown below. The heading information will contain:

```
   POLICY:  Policy Title                    Section Section No.
 STANDARD:                                    #:
PROCEDURE:                                    #:
GUIDELINE:                                    #:
                                       PUB. DATE:    MM/DD/YY
                                     REVIEW DATE:    MM/DD/YY
                                            PAGE:    n OF m
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### Standards

The general heading format for ISD's MANUAL OF STANDARDS' Standards is shown below. The heading information will contain:

```
   POLICY:  Policy Title                    Section Section No.
 STANDARD:  Standard Title                    #:    Seq. No.
PROCEDURE:                                    #:
GUIDELINE:                                    #:
                                       PUB. DATE:    MM/DD/YY
                                     REVIEW DATE:    MM/DD/YY
                                            PAGE:    n OF m
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Each Standard will identify what must be done to support the Policy or an aspect of it.

## Procedures

The general heading format for ISD's MANUAL OF STANDARDS' Procedures is shown below. The heading information will contain:

| | | | |
|---|---|---|---|
| **POLICY:** | Policy Title | **Section #:** | Section No. Seq. No. |
| **STANDARD:** | Standard Title | **#:** | Seq. No. |
| **PROCEDURE:** | Procedure Title | **#:** | Seq. No. |
| **GUIDELINE:** | | **#:** | |
| | | **PUB. DATE:** | MM/DD/YY |
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Each Procedure will identify what must be done to support the associated Standard or an aspect of it.

## Guidelines

The general heading format for ISD's MANUAL OF STANDARDS' Guidelines is shown below. The heading information will contain:

| | | | |
|---|---|---|---|
| **POLICY:** | Policy Title | **Section #:** | Section No. Seq. No. |
| **STANDARD:** | Standard Title | **#:** | Seq. No. |
| **PROCEDURE:** | Procedure Title | **#:** | Seq. No. |
| **GUIDELINE:** | Guideline Title | **PUB. DATE:** | MM/DD/YY |
| | | **REVIEW DATE:** | MM/DD/YY |
| | | **PAGE:** | n **OF** m |

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Each Guideline will identify a recommended sequence of events to support the associated Standard and/or Procedure. A Guideline may support a Standard when no formal Procedures have been identified.

## ISD STANDARDS CATEGORIES

09/21/89

| TITLE | POLICY SECTION | STANDARD | PROCEDURE | GUIDELINE | APPENDIX |
|---|---|---|---|---|---|
| GENERAL | 1-12000 | | | | |
| TELECOMMUNICATIONS | 1-12100 | | | | |
| HARDWARE | 1-12200 | | | | |
| SOFTWARE | 1-12300 | | | | |
| INFORMATION SYSTEMS | 1-12400 | | | | |
| RECORDS MANAGEMENT | 1-12500 | | | | |
| SECURITY AND CONTINGENCY PLANNING | 1-12600 | | | | |

| TITLE | POLICY SECTION | STANDARD | PROCEDURE | GUIDELINE | APPENDIX |
|---|---|---|---|---|---|
| TELECOMMUNICATIONS | 1-12100 | | | | |
| **Coordination and Control of State Telecommunications Systems** | **1-12101** | | | | |
| Management of State Government Telecommunications Systems | | 01 | | | |
| State Telephone Directory | | 01.01 | | | |
| Accounting and Billing | | 01.02 | | | |
| Procurement of Telecommunications Equip. | | 02 | | | |
| Ordering Telephone Equip. & Services | | 02.01 | | | |
| Non-State Agency Use of the State Telecommunications Systems | | 03 | | | |
| Local Area Networks | | 04 | | | |
| **Use of the State Telephone System** | **1-12102** | | | | |
| State Issued Credit Cards | | 01 | | | |
| State Agency Responsibilities | | 02 | | | |
| **All Telecommunications Records are Public Documents** | **1-12103** | | | | |

| TITLE | POLICY SECTION | STANDARD | PROCEDURE | GUIDELINE | APPENDIX |
|---|---|---|---|---|---|
| **SOFTWARE** ---------- | **1-12300** | | | | |
| **Management of Software** | **1-12301** | | | | |
| Procurement of System Software | | 01 | | | |
| ISD Supported Software | | 02 | | | |
| Job Control Language | | 03 | | | |
| JCL Guidelines | | 03.00.01 | | | |
| Standardized Use of Software | | 04 | | | |
| COBOL Coding Guidelines | | 04.00.01 | | | |
| ADS Guidelines | | 04.00.02 | | | |
| PANVALET (Source Code Maintenance) | | 04.00.03 | | | |
| EASYPROCLIB (JCL Procedure Library) | | 04.00.04 | | | |
| Definition of Terms | | | | | A |
| System Component Codes | | | | | B |
| Agency and Group Identifiers | | | | | C |
| Job Code Limits and Defaults | | | | | D |
| Mainframe Application Software | | | | | E |
| Microcomputer Application Software | | | | | F |

| TITLE | POLICY SECTION | STANDARD | PROCEDURE | GUIDELINE | APPENDIX |
|---|---|---|---|---|---|
| INFORMATION SYSTEMS ---------- | 1-12400 | | | | |
| Information Systems Development | 1-12401 | | | | |
| System Development Method | | | | | 00.00.01 |

| TITLE | POLICY SECTION | STANDARD | PROCEDURE | GUIDELINE | APPENDIX |
|---|---|---|---|---|---|
| RECORDS MANAGEMENT ---------- | 1-12500 | | | | |
| **Composition and Function of the State Records Committee** | **1-12501** | | | | |
| **Public Records Management** | **1-12502** | | | | |
| Agency Management of Public Records | | 01 | | | |
| Protection and Preservation of Public Records | | 02 | | | |
| Protection of Public Records | | 02.01 | | | |
| Reproduction of Essential Public Records | | 02.01.01 | | | |
| Transfer of Public Records | | 03 | | | |
| Disposal of Public Records | | 04 | | | |
| Definition of Terms | | | | | A |

| TITLE | POLICY SECTION | STANDARD | PROCEDURE | GUIDELINE | APPENDIX |
|---|---|---|---|---|---|
| **SECURITY AND CONTINGENCY PLANNING ----- 1-12600** | | | | | |
| **Information System Contingency Planning** | **1-12601** | | | | |
| Categorizing Automated Systems | | 01 | | | |
| End User Responsibilities | | 02 | | | |
| Contingency Plan Considerations | | 02.00.01 | | | |
| Data Center Responsibilities | | 03 | | | |
| Contingency Plan Considerations | | 03.00.01 | | | |
| Definition of Terms | | | | | A |
| Prioritizing Information Systems | | | | | B |
| **Security of Data and Information Technology Resources** | **1-12602** | | | | |
| Information Access Control | | 01 | | | |
| Recognition and Training of Agency Security Officers | | 01.01 | | | |
| Controlling Access to Agency Data | | 01.02 | | | |
| Controlling Access to Databases and Sensitive Information | | 01.02.01 | | | |
| **Control of System Software** | **1-12604** | | | | |
| Definition of Terms | | | | | A |

POLICY: Coordination and Control of State Telecommunications Systems — Section 1-12101

STANDARD: #:
PROCEDURE: #:
GUIDELINE: #:

PUB. DATE: 09/21/89
REVIEW DATE:


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I. Policy

The Department of Administration will provide and supervise all State government telecommunications systems for shared voice and data services and networks for agencies, departments, colleges and universities.

II. Scope of State Government Telecommunications Systems

The State's telecommunication systems include any State owned, leased, contracted for, operated or maintained telecommunications equipment, services or facilities including:

**A.** private branch exchanges;

**B.** key telephone systems;

**C.** teleconferencing systems;

**D.** local and long distance telecommunication circuits;

**E.** data communications equipment;

**F.** video capabilities;

**G.** land mobile radio equipment;

**H.** telephone credit cards;

**I.** facsimile equipment.

**J.** Local Area Networks (LAN's)

III. Authorization

The Department of Administration has been directed by the Legislature to be responsible for the provision and supervision of communications systems (Section 2-17-302, MCA).

IV. Background

An effective internal communications capability is a critical requirement and strategic tool for government. An even more important requirement is ensuring that the government is accessible to the people. Montana's sparse population spread over great distances make these goals more important, and more difficult, to achieve.

With the divestiture of the AT&T/Bell system and the increased deregulation of telecommunications services, especially as implemented in the Montana Telecommunications Act (69-3-801, MCA), the state has growing responsibility for planning and managing its own telecommunications function.

I. Management of State Government Telecommunications Systems

The Department of Administration, acting through the Telecommunications Bureau of the Information Services Division, is responsible for the management of the telecommunications services for state government.

II. Management Objectives for State Telecommunications Systems

The Telecommunications Bureau's objectives in managing the State's telecommunications systems are to:

A. improve the availability and reliability of the State's telecommunications services;

B. deliver the best services at the lowest possible cost;

C. plan for and provide system flexibility to meet changing needs and opportunities.

III. Telecommunications Bureau Responsibilities

The Telecommunications Bureau will be responsible for:

A. providing communications services to all agencies of State government;

B. exercising general supervision over all existing communications systems for all agencies of State government;

C. planning, reviewing and approving any additional installations of communications equipment or systems for all agencies of State government, in coordination with the executive heads of the agencies;

D. approving standards and procedures for selection, acquisition and operation of communications equipment;

III. Telecommunications Bureau Responsibilities (continued)

**E.** ensuring that all communications equipment is properly installed and maintained;

**F.** providing assistance to the Legislature, Governor, and State agencies relative to state and interstate communications matters;

**G.** providing a means whereby political subdivisions of the State may utilize the State communications system;

**H.** accepting federal funds granted by congress or executive order for any of these purposes, as well as gifts and donations from individuals and private organizations or foundations;

**I.** fostering the development of new and innovative communications systems and techniques within the state.

**J.** assisting departments and agencies in:

**1.** assessing current telecommunications configurations needs;

**2.** planning for future needs;

**3.** training staff in the use of telecommunications systems already in place.

**K.** periodically arranging meetings for Communications Coordinators to provide updated information on procedures and available capabilities, and to exchange information on common concerns.

IV. Optional Responsibilities for the Telecommunications Bureau

The Department may provide assistance to political subdivisions or non-profit organizations, upon such terms that the Department may establish, relative to State and interstate communications systems and techniques.

V. State Agency Responsibilities

**A.** The responsibility for the approval of proposed changes, additions or deletions of telecommunications equipment or services within a department or agency shall reside with that department or agency.

**B.** Each department or agency shall assign one or more individuals as "Communications Coordinator(s)".

**1.** The person(s) designated must have authority to approve telecommunications expenditures for the agency or department.

**2.** The name(s) of the Communications Coordinator(s) shall be provided to the Telecommunications Bureau.

**3.** If a department or agency fails to assign a Communications Coordinator, the Telecommunications Bureau will refer these duties to the department's or agency's chief administrator, fiscal officer or highest ranking officer.

**C.** Each department or agency is individually responsible for all costs incurred in the operation of the telecommunications systems utilized by the agency.

| | | | |
|---|---|---|---|
| POLICY: | Coordination and Control of State Telecommunications Systems | Section | 1-12101 |
| STANDARD: | Management of State Government Telecommunications Systems | #: | 01 |
| PROCEDURE: | State Telephone Directory | #: | 01 |
| GUIDELINE: | | #: | |
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I. Maintaining the State Telephone Directory

**A.** The Telecommunications Bureau will:

**1.** maintain the online telephone directory of State personnel;

**2.** annually issue a printed Montana State Telephone Directory.

**B.** Communications Coordinators are responsible for notifying the Telecommunications Bureau of all additions, corrections, modifications, or deletions of listings for the directory for their respective department or agency.

| | | | |
|---|---|---|---|
| POLICY: | Coordination and Control of State Telecommunications Systems | Section | 1-12101 |
| STANDARD: | Management of State Government Telecommunications Systems | #: | 01 |
| PROCEDURE: | Accounting and Billing | #: | 02 |
| GUIDELINE: | | #: | |
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I. Accounting and Billing

**A.** Each month the Telecommunications Bureau will bill agencies for their equipment, long distance usage, and other telephone related costs.

**B.** The Bureau will provide detailed statements of the calls made from each extension or at the most practical level of detail during the prior month.

**C.** Any billing questions should be directed to the Accounting Section of the Bureau.

| | | | |
|---|---|---|---|
| POLICY: | Coordination and Control of State Telecommunications Systems | Section | 1-12101 |
| STANDARD: | Procurement of Telecommunications Equipment | #: | 02 |
| PROCEDURE: | | #: | |
| GUIDELINE: | | #: | |
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I. Purchase or Lease of Telecommunications Equipment

**A.** All telecommunications systems for State departments and agencies, including private branch exchanges (PBXs) and key telephone systems, are to be obtained through the Telecommunications Bureau.

**B.** The Telecommunications Bureau will coordinate the procurement process with the requesting agency and the Purchasing Division.

**C.** The Telecommunications Bureau requests that:

**1.** Departments and agencies channel these requests through their Communications Coordinators.

**2.** Agencies allow 90 days lead time in submitting these requests to the Telecommunications Bureau.

II. Telecommunications Equipment Available on Term Contract

**A.** The Telecommunications Bureau, in coordination with the Purchasing Division, maintains a term contract for the acquisition of two-way radio equipment.

**B.** All two-way radio equipment should be purchased through the term contract.

| | | | |
|---|---|---|---|
| POLICY: | Coordination and Control of State Telecommunications Systems | Section | 1-12101 |
| STANDARD: | Procurement of Telecommunications Equipment | #: | 02 |
| PROCEDURE: | Ordering Telephone Equipment and Services | #: | 01 |
| GUIDELINE: | | #: | |
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I. Ordering Telephone Equipment and Services

**A.** All requests for installation, modification, relocation or removal of telephone equipment and services shall be submitted on a Telephone Service Request Form, available from Central Stores.

**B.** These requests should be submitted to the Telecommunications Bureau a minimum of thirty (30) working days prior to the requested service date.

| | | | |
|---|---|---|---|
| POLICY: | Coordination and Control of State Telecommunications Systems | Section | 1-12101 |
| STANDARD: | Non-State Agency Use of the State Telecommunications Systems | #: | 03 |
| PROCEDURE: | | #: | |
| GUIDELINE: | | #: | |
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I. Use of State Telecommunications Facilities by other Political Subdivisions

**A.** The Department of Administration is authorized to provide a means whereby political subdivisions of the state may utilize the State telecommunications system.

**B.** Political subdivision means any county, city, municipal corporation, school district, special improvement district or taxing jurisdiction, or any other political subdivision or public corporation.

**C.** Requests from political subdivisions shall be submitted in writing to the Telecommunications Bureau. The Bureau will review these requests, particularly with respect to the potential impact on State agency use of the systems, and will respond to the political subdivision within 180 days of receipt of their written request.

**D.** These other political subdivisions will be billed for the use of the State's telecommunications system at a rate determined by the Telecommunications Bureau.

II. Non-profit Organization Use of the State Telecommunication Systems Allowed

**A.** The State telecommunication systems are available for use by in-state non-profit organizations that meet one of the following three criteria:

**1.** there is a close connection between the organization and the State;

**2.** the State is significantly involved in the activities of the organization;

**3.** the organization performs a public function traditionally performed by the State.

II. Non-profit Organization Use of the State Telecommunication Systems Allowed (continued)

B. Non-profit organizations must make written requests to the Department of Administration for access to its systems.

1. These written requests must provide adequate detailed information for the Department to determine if the non-profit organization meets any of the criteria defined above.

2. Use of the State's telecommunication systems shall be authorized for organizations meeting the criteria based upon the technical requirements of the non-profit organization's needs as indicated by the request and the potential impact on State agency use of the systems.

3. In consultation with the appropriate agency, the Department will approve or disapprove requests for access by non-profit organizations within 180 days of receipt of written requests.

C. Non-profit organizations will be billed for use of the State's telecommunication systems under procedures and at rates developed by the Department.

| | | | |
|---|---|---|---|
| POLICY: | Coordination and Control of State Telecommunications Systems | Section | 1-12101 |
| STANDARD: | Local Area Networks | #: | 04 |
| PROCEDURE: | | #: | |
| GUIDELINE: | | #: | |
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I. Management of Local Area Networks

Local Area Networks (LAN's) are managed as an integral part of the State's Telecommunications Network.

II. Local Area Network Topology

A standard LAN topology will be used to provide a manageable interface for all Local Area Networks.

A. The Token Ring, IBM 802.5, will be the standard topology used for all Local Area Networks.

B. Token Ring components compatible with IBM components and environment will be considered standard and supported by ISD. Appropriate components will be listed on current term contracts.

III. Technical Support for Local Area Networks

To insure connectivity of the State's diverse computer systems the Information Services Division will maintain a local area network support staff which can respond to agency needs for technical support of the standard Local Area Network topology.

| | | | |
|---|---|---|---|
| POLICY: | Use of the State Telephone System | Section #: | 1-12102 |
| STANDARD: | | #: | |
| PROCEDURE: | | #: | |
| GUIDELINE: | | #: | |
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I. Policy

State telephones are provided for the conduct of State business. In addition to State business, the State's telecommunication systems may be used by State employees and officials for local and long distance calls to latch-key children, teachers, doctors, day-care centers and baby sitters, to family members to inform them of unexpected schedule changes, and for other essential personal business.

**A.** The use of the State's telecommunication systems for essential personal business must be kept to a minimum, and not interfere with the conduct of State business.

**B.** Essential personal long distance calls must be either collect, charged to a third party non-state number, or charged to a personal credit card.

| | | | |
|---|---|---|---|
| POLICY: | Use of the State Telephone System | Section #: | 1-12102 |
| STANDARD: | State Issued Telephone Credit Cards | #: | 01 |
| PROCEDURE: | | #: | |
| GUIDELINE: | | #: | |
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I. Use of State Issued Telephone Credit Cards

**A.** State issued telephone credit cards are provided for the conduct of state business while in a travel status, and are not to be used for personal calls.

**B.** Personal long distance calls while in a travel status are to be made either collect, charged to a third party non-state number, or charged to a personal credit card.

| | | | |
|---|---|---|---|
| POLICY: | Use of the State Telephone System | Section #: | 1-12102 |
| STANDARD: | State Agency Responsibilities | #: | 02 |
| PROCEDURE: | | #: | |
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I. Development of Agency Policies

Agencies are encouraged to develop and promulgate telecommunications policies appropriate to their own needs.

II. Instruction on the Use of State Telephones

Each State agency is responsible for instructing their personnel on the policies, use and controls relating to State telephones.

III. Enforcement

Each State agency is responsible for the appropriate enforcement of policy 1-12102 Use of the State Telephone System and related agency policies.

| | | | |
|---|---|---|---|
| POLICY: | All Telecommunications Records are Public Documents | Section | 1-12103 |
| STANDARD: | | #: | |
| PROCEDURE: | | #: | |
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I. Policy

All records of use of the telecommunication systems created, maintained and managed by the Department are public documents and subject to review by the public, unless protected by statute.

| | | | |
|---|---|---|---|
| POLICY: | Management of Software | Section #: | 1-12301 |
| STANDARD: | | #: | |
| PROCEDURE: | | #: | |
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I. Policy

The Information Services Division will provide and maintain software products for the development and maintenance of State agency application systems on mainframe and microcomputers.

| | | | |
|---|---|---|---|
| POLICY: | Management of Software | Section #: | 1-12301 |
| STANDARD: | Procurement of System Software | #: | 01 |
| PROCEDURE: | | #: | |
| GUIDELINE: | | #: | |
| | | PUB. DATE: | 09/21/89 |
| | | REVIEW DATE: | |
| | | PAGE: | 1 OF 1 |

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I. Procurement of Mainframe Software

A. All mainframe software will be evaluated and acquired according to internal procedures established by the Information Services Division.

B. Agencies perceiving a need for mainframe software that is not currently available should contact the ISD Administrator.

II. Procurement of Microcomputer Software

A. All microcomputer software will be evaluated for consideration as a state standard according to internal procedures established by the Information Services Division.

B. Agencies perceiving a need for a new or different state standard in microcomputer software should contact the ISD Administrator.

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I. Supported Software

A. New software products acquired through the software procurement procedures will be reviewed to determine the appropriate level of support.

B. Each software product supported by ISD will be assigned a support level that identifies the scope of support that will be provided for the product. The support levels are:

1. **FULL SUPPORT**
   - Maintain a Vendor Supported Release
   - Monitor and Maintain Performance
   - Provide User Education
   - Document Standards, Procedures, and Guidelines
   - Maintain Technical Expertise
   - Assure System Compatibility
   - Assist in Problem Resolution

2. **LIMITED SUPPORT**
   - Maintain a Vendor Supported Release if possible
   - Provide Limited or No User Education
   - Assure System Compatibility within Time and Resource Constraints
   - Assist in Problem Resolution within Time and Resource Constraints
   - Periodic Review for Software Disposal

3. **SUNSET SUPPORT**
   - Plan for Software Disposal

4. **SPECIAL CASE**
   These products are available through special agreements with selected agencies. The type and extent of the support provided by ISD depends on the particular product and the special arrangements made with the user agency. These products are not available for general use.

C. Appendix B lists the supported mainframe software products.

D. Appendix C lists the supported microcomputer software products.

I. Job Control Language Requirements

Job Control Language (JCL) for jobs running on the ISD mainframe computer(s) must meet the following requirements.

A. JOB Card

```
//XYSSSSSS JOB (AAAAA,CC(,FLD-1,FLD-2,...,FLD-8)),
//             MMMM.BB.NNN...N(,Keyword Parameters)
```

1. **XYSSSSSS - Job Name**
   a. The Job Name field will be edited for validity. Jobs with invalid Job Names will be cancelled.

   b. **X** identifies the system component that was used to submit the job, i.e. local reader, TSO, RJE, CICS, etc. System Component Codes are identified in Appendix B.

   c. **Y** identifies the agency or group submitting the job. Agency and group identifiers are assigned by the Information Services Division and listed in Appendix C.

   d. **SSSSSS** are six alphanumeric characters of the user's choice to identify the job.

2. **(AAAAA,CC(FLD-1,FLD-2,...,FLD-8)) - Job Accounting**
   a. **AAAAA** is the five digit account number used for billing. This is a required field.

   b. **CC** is the Operation Code (OP-CODE) that identifies the type of job being run. This is a required field. Operation Codes are listed in Appendix D.

   c. **(,FLD-1,FLD-2,...,FLD-8)** identifies the eight optional extended accounting fields.

      (1.) Agencies can define these fields to meet their own needs.
      (2.) Fields that are used may have from one to seven numeric digits and will be edited to ensure that they are numeric and do not exceed seven digits.

2. **(AAAAA,CC(FLD-1,FLD-2,...,FLD-8)) - Job Accounting**

   c. **(,FLD-1,FLD-2,...,FLD-8)** (continued)

      (3.) When one field is used and preceding fields are unused, the absence of each preceding field must be indicated with a comma, i.e. if **FLD-4** is the only field used the optional accounting information would appear as **(,,,,FLD-4)**.

3. **MMMM.BB.NNN...N** identifies the responsible user.

   a. **MMMM** is the four digit User Number assigned by the Information Services Division. This is a required field.

   b. **BB** identifies the Output Box Number for distributing output printed on ISD printers. It is an optional field, but should be coded to insure distribution.

   c. **NNN...N** is an optional field up to eight characters in length that may be used for the user's name.

4. The current valid keyword parameters and their defaults and limits are listed in Appendix D - JOB STATEMENT - KEYWORD PARAMETERS.

B. SETUP statement format

```
/*SETUP 999999,999999,999999,etc.
                or
/*SETUP DSN=XXX.XXXX.XXX(+0)
```

1. ISD requires a SETUP statement be used in all jobs which will request the mount of a specific tape. The absence of this statement may cause the job to be canceled. The manner in which ISD employs this statement is somewhat different than described in the MVS JCL manual. These differences are explained below.

   a. The use of the SETUP statement does not cause the job to be placed in hold status.

   b. Either the volume serial number of a tape or the dataset name (of a cataloged dataset) may be used to identify the requested volumes. These two methods of coding the SETUP statement are illustrated in the examples above.

C. EXEC Statement keyword parameter defaults and correct values are listed in Appendix D - EXEC STATEMENT - KEYWORD PARAMETER DEFAULTS.

D. DD Statement keyword parameter defaults and correct values are listed in Appendix D - DD STATEMENT - KEYWORD PARAMETER DEFAULTS AND VALUES.

I. Job Control Language Guidelines

Job Control Language (JCL) should be developed for ease of maintainability. The following conventions should be consider for all JCL, whether one time jobs or production job stream.

A. Catalog procedures

1. Develop JCL using catalog procedures. Catalog procedures should be stored in agency or system procedure libraries.

2. Design all procedures to allow use for both test and production processing (see symbolic parameters).

3. Vertically align parameters as necessary to improve readability.

4. Use symbolic parameters and supply defaults whenever useful.

   a. On the PROC statement code one symbolic parameter per line. Give a short, explanatory comment for each.

   b. Use '&PGMNAME' on the EXEC statement.

   c. Use '&SUF' appended to the third node of the DSN .

5. Use condition code checking to control step execution.

B. JCL Format should be consistent throughout.

1. Comments.

a. Place a Procedure Comment Block after the 'PROC' card to identify the procedure (use TSO wild card). Include the following:

- System Name
- Proc Name
- Proc Title and Description
- Example Execute JCL
- Restart Instructions

b. Place a Step Comment Block after the 'EXEC' card to identify the step (use TSO wild card). Place the Step Comment Block after the 'EXEC' statement. Include the following:

- Program Number
- Program Title
- Program Description
- If the program has a sort, identify the sort fields and indicate if the field is sorted ascending or descending.

2. Use the program name as the step name.

3. DD statements should appear in the following order in each step:

a. STEPLIB
b. SYSOUT
c. SYSDBOUT
d. SYSUDUMP
e. SORTMSG
f. SYSIN
g. SORTWK'S
h. IDMS FILES
i. 'I' DD STATEMENTS (INPUTS)
j. 'O' DD STATEMENTS (OUTPUTS)
k. 'R' DD STATEMENTS (REPORTS)
l. CPXMRPTS
m. CPXTIMSV
n. CPXMOPTS

B. JCL Format (continued)

4. Code DD parameters one per line, vertically aligned starting in position 16 in the following order:

a. DSN (Code the DSN text name in the right margin)
b. DISP
c. UNIT
d. VOL
e. LABEL
f. DCB
g. SPACE

C. DD keyword use.

1. DSN -

a. Only use '&&' DSN's for temporary datasets used only by a single job step.

b. 'DD *' must be included in the step as a 'DD DUMMY' with the 'DD *' override statement placed in the execute JCL.

c. Assign a system Dataset name SN (FNN.SS.X.A99) for all datasets except those used by a single job step.

d. Code symbolic names for generation levels of generation datasets to allow ease of restart.

f. Use dataset refer-backs when possible. Refer to the step in which a dataset was most recently used.

g. Comment the dsn statement to identify the dataset being used and how the dataset is being used (I, O, or I/O).

C. DD keyword use. (continued)

2. DISP

a. Always use 3 DISP parameters.
b. Catalog all datasets.

1) Use generation data groups for all tape datasets.

2) Delete temporary datasets in a final IEFBR14 step or throughout the job after they are no longer needed for restart.

3. VOL - Use the RETAIN subparameter if creating a tape that will be used in a subsequent step.

4. DCB

a. Use efficient dataset blocking factors. Make them as high as possible with consideration for excessive REGION SIZE.

b. Code RECFM, LRECL, and BLKSIZE subparameters for all output datasets.

c. Use dataset refer-backs when possible. Refer to the step in which a dataset was most recently used.

5. SPACE

a. Code 'RLSE' on all space allocations.

b. Do not use symbolic parameters for SYSDA space allocations unless special circumstances require their use. Code a secondary allocation to provide for unanticipated growth. Code space in blocks not cylinders or tracks.

6. Define SYSOUT to paper different than the JCL.

7. DEST - Code 'DEST=CENTRAL' on all 'SYSUDUMP' statements.

D. Execution JCL

1. JOB card

a. JOBNAME - the optional SSSSSS should include either the User Number of the person responsible for the job or other information which can be used to identify the job.

b. USERID - user number should always be the number of the individual or function responsible for tape management for the system (all tapes will appear under this number).

c. BOX NUMBER - should always be coded.

d. USER NAME - should be the name of the person responsible for input/output control of the production job.

2. /*ROUTE - use /*ROUTE PRINT CENTRAL for all production procedures.

I. Mainframe Applications

A. Only software products that are supported by the Information Services Division will be used for developing new or enhancing existing mainframe application systems.

B. Appendix B contains a list of supported mainframe software products.

II. Microcomputer Applications

A. Only software products that are supported by the Information Services Division's Information Center Bureau will be used for developing new or enhancing existing microcomputer applications that are statewide in scope and supported by the Department of Administration.

B. Appendix C contains a list of supported microcomputer application software.

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I. Introduction

The COBOL Coding Guidelines presented in this section are suggested for use in the development of COBOL programs. The purpose of having guidelines is to provide a common set of conventions for developing and documenting COBOL programs.

II. General Coding Considerations

A. **Comments** - Use the Asterisk (*) in column 7 for program notations and comments. The NOTE verb should not be used.

B. **Indentation** - All indentations in the program should be 2 or more spaces.

C. **Program Listings** - The eject statement should be used between divisions and between large modules in the procedure division. The skip statement or blank lines can be used between paragraphs or sections of a module to improve readability.

D. **Alignment** - Vertically align like items within the program. For example, in the Data Division:

```
01  RPT-REPORT-FIELDS
     05  RPT-LINE-COUNTER      PIC S9(3)
     05  RPT-PAGE-COUNTER      PIC S9(5)
     05  RPT-PAGE-TOTAL        PIC S9(5)V99
```

in the Procedure Division:

```
MOVE EMPLOYEE-NAME  TO RPT-EMPLOYEE-NAME
MOVE NET-PAY        TO RPT-NET-PAY
MOVE ZERO           TO TOTAL-GROSS
                       TOTAL-FICA
                       TOTAL-TAX
```

E. **Identification Division**

Author. Must be present with the name of the original author of the program.

Name. Include the title of the program after the Program Name for documentation.

Date Written. Must be present with the month and year that unit testing of the original program was completed. This field is not updated for program changes.

Date Compiled. Must be present. This field is left blank and filled in by the compiler.

Remarks. Must be present and shall include:

A brief description of the purpose of this program.

The programmer's name, date, program change request number, system enhancement request number and a brief description of the change made.

F. **Environment Division**

Select Statement. Use the file-status clause for all VSAM files. For example:

```
Select VSAM-FILE Assign to DA-DDNAME
     File-status is VSAM-STATUS
```

Alignment. Vertically align Select, Assign, and External DDNAME clauses. For example:

```
Select Update-Trans-File Assign to UT-S-I00675D1.
Select Master-File       Assign to UT-S-I00675M1.
Select Update-Register   Assign to UT-S-RP123401.
```

F. **Environment Division** (continued)

Assign Clause. In the Assign Clause, all standard sequential files must specify utility in the device class parameter (I.E., UT-S-DDNAME). The DDName may have one of two formats. The format for report files is: RP XXXXX X

where

| Level | Description |
|---|---|
| RP: | Abbreviation for report |
| XXXXX: | Program Number |
| X: | Consecutive Number (1-9) |

The format for non-report files is: A BB CCC D E

where

| Level | Description |
|---|---|
| A: | File Usage<br>I - input<br>O - output<br>W - work |
| BB: | Agency Number* |
| CCC: | System Number* |
| D: | Type of file* |
| E: | Consecutive Number (1-9)* |

* Agency number, system number, type of file and consecutive number should correspond to these elements in the dataset name. (Refer to file definition procedures.)

G. **Data Division**

Record Contains. The Record Contains clause must be specified for all FD's and SD's.

Block Contains. "Block Contains 0 Records" must be specified for all standard sequential files, including report files.

Prefixing. Assign a reasonable prefix to each level 01 item in the program and use this prefixing on every subordinate data item (except filler). Alphabetizing working storage group items is recommended.

Data Names. Use Data Names that are clear, descriptive, and meaningful. For example, use:

MF-ACCOUNTING-ENTITY not MF-A-E.

Use consistent abbreviations throughout a program and a system. When possible, use established abbreviations. Refer to Element Name Abbreviation List in the Administrative file.

Separate the logical parts of data names with hyphens. For example, use MF-NET-PAY rather than MFNETPAY, or OUTPUT-RECORD rather than OUTPUTREC.

Alignment. Vertically align PICTURE, VALUE, and USAGE CLAUSES. For example:

```
01   WC-CONSTANTS
     05   WC-NBR-DAYS     PIC S9(3)       VALUE +365
     05   WC-NBR-MONTHS   PIC S9(3)       VALUE +12
     05   WC-MAX-AMOUNT   PIC S9(5)V99    VALUE +1000.00
     05   WC-YEAR         PIC X(4)        VALUE 'YEAR'
```

Use PIC X(4) rather than PIC XXXX, PIC 9(7)V 9(5) rather than PIC 9999999V9999.

G. **Data Division** (continued)

Constants. All data items that remain constant throughout a program, but are subject to change, must be defined in a value clause in the Data Division. For example, in the Data Division:

```
01 MF-FICA-RATE     PIC S9V99      VALUE +5.85
```

and in the Procedure Division:

```
COMPUTE MF-FICA-TAX = (MF-GROSS * MF-FICA-RATE)
```

rather than:

```
COMPUTE MF-FICA-TAX = (MF-GROSS * 5.85)
```

Numeric fields. All numeric data that is to be used in computations must be signed; all comp-3 fields must be signed and should be an uneven size (i.e. 1, 3, 5...)

77 Level. Level 77's are not allowed, structure related data items under separate level 01 entries. For example:

```
01   WM-MESSAGE
     05 WM-ABEND-MSG          PIC X(5) VALUE 'ABEND'.
     05 WM-NORMAL-END         PIC X(3) VALUE 'EOJ'.
01   WGC-GLOBAL-COUNTERS
     05 WGC-PAGE-NUMBER       PIC S99.
     05 WGC-LINE-NUMBER       PIC S99.
     05 WGC-RECORD-NUMBER     PIC S99.
```

Subordinate Entries. All subordinate 01 data description entries are to be indented and incremented consistently.

For example:

```
01   INPUT-RECORD.
     05 INPUT-RECEIVED-DATE.
          10 INPUT-RECEIVED-MONTH PIC 99.
          10 INPUT-RECEIVED-DAY   PIC 99.
          10 INPUT-RECEIVED-YEAR  PIC 99.
```

G. **Data Division** (continued)

Tables. Loading records from a database into a table for subsequent table search should not be done unless performance is an issue.

Condition Names - Level 88. Level 88's with a meaningful condition names are to be used in logical tests rather than literals whenever level 88's will increase ease of understanding.

```
01   MF-SEX-CODE    PIC X.
     88 MALE        VALUE 'M'.
     88 FEMALE      VALUE 'F'.
```

And in Procedure Division:

```
use IF FEMALE
rather than IF MF-SEX-CODE = 'F'
```

Exception: Condition names for IDMS data elements must follow Database Administration naming conventions.

H. **Procedure Division**

General Logic.

- A program should have one entry and one exit point.
- The Procedure Division should have three or four PERFORM statements: PERFORM A-HOUSEKEEPING, PERFORM B-MAIN, AND PERFORM C-TERMINATE or PERFORM A-HOUSEKEEPING, PERFORM B-SORT-INPUT, PERFORM C-SORT-OUTPUT, AND D-TERMINATE for programs with an internal sort.
- A program should be structured using performed paragraphs rather than repeating sections of code.
- Database retrieval, update commands should be performed rather than having multiple commands for the same function for the same record.

Accept Verb. The 'from console' option of the accept verb is discouraged and should only be used in special cases.

Alter Statement. The ALTER verb is not allowed.

H. **Procedure Division** (continued)

Dates. Use DATECVT to get the current date or to perform other date related functions. DATECVT is supported by and documentation is available from the Department of Administration, Information Services Division, Technical Services Section. Do not use ACCEPT to obtain system dates.

Display Verb. The 'UPON CONSOLE' option of the DISPLAY verb is discouraged and should only be used in special cases. All new systems should use job status reporting with minimal or no Display use.

Record Initialization. All records should be initialized at the field level unless every field is of the same data format (and very likely to stay that way!).

VSAM Status. Interrogate the FILE-STATUS indicator on every VSAM file access.

GO TO. GO TO statements should be eliminated as much as possible. There are three cases, however, where use of a GO TO may produce more understandable code than overly nested IF's or other convoluted logic.

1. A GO TO DEPENDING ON can be used in place of nested IF statements for a CASE construct with more than just a few cases. For example:

```
                GO TO EDIT-FIELD1,
                EDIT-FIELD2,
                o
                o
                o
                EDIT-FIELDn
                DEPENDING ON FIELD-NUMBER
           EDIT-FIELD1.
                o
                o
                o
                GO TO EDITS-EXIT.
```

H. **Procedure Division** (GO TO, 1. continued)

```
                    EDIT-FIELD2.
                         o
                         o
                         o
                         GO TO EDITS-EXIT.
                         o
                         o
                         o
                    EDIT-FIELDn.
                         o
                         o
                         GO TO EDITS-EXIT.
                         o
                         o
                         o
```

2. In order to branch to the end of a procedure without leaving the procedure and thus return control to the statement following a PERFORM for that procedure, use the THRU option of the PERFORM and then GO TO the end of the procedure as in the following example:

```
PERFORM SETUP1 THRU SETUP1-EXIT
          o
          o
          o
     SETUP1
          READ IN-FILE INTO IN-RECORD
               AT END GO TO SETUP1-EXIT.
          MOVE IN-RECORD TO OUT-RECORD.

          MOVE SPACES TO IN-RECORD.
     SETUP1-EXIT.  EXIT.
```

3. A third valid use for a GO TO would be to branch to an end-of-program paragraph immediately following the main driver module whenever a serious ABEND condition arises in the program.

Also, GO TO's may appear in a CICS routine where they may be generated by CICS macros.

H. **Procedure Division** (continued)

Boolean Operators. The words GREATER THAN and LESS THAN are to be used rather than symbols.

IF Statements. Successive levels of nested IF Statements must be indented consistently. An ELSE Clause must be aligned with its corresponding IF statement and must be on a line by itself. For example use:

```
IF STATE EQUAL MONTANA
     ADD 1 TO RESIDENT
     IF COUNTY EQUAL YELLOWSTONE
          ADD 1 TO NUMBER-SELECTED
     ELSE
          NEXT SENTENCE
ELSE
     ADD 1 TO NON-RESIDENT
```

Be aware of constructs available to avoid overly complicated nested IF's such as the GO TO DEPENDING ON.

Paragraph and Section Names. Each paragraph/section name must appear on a line by itself.

Perform Statements. The values of the loop control variables associated with the VARYING and BY phrases of a PERFORM Statement may not be modified within the performed procedure. Indent and align the VARYING and UNTIL Clauses. For example, use:

```
     PERFORM B1-MAIN-LOGIC
          VARYING INDEX
          FROM 1 BY 1
          UNTIL INDEX GREATER THAN 10
or
     PERFORM B1-MAIN-LOGIC
          VARYING
               INDEX FROM 1 BY 1
          UNTIL
               INDEX GREATER THAN 10
```

H. **Procedure Division** (Perform Statements continued)

rather than;

```
PERFORM DRIVER-MODULE VARYING INDEX
FROM 1 BY 1 UNTIL INDEX GREATER THAN 10.
```

Reads and Writes. Only one READ Statement is allowed per type of file retrieval. Only one WRITE/Rewrite Statement for each different length and kind of output record is allowed. This does not apply to IDMS commands.

Statement Format. Begin each sentence in column 12 and end each sentence with a period. If a sentence requires more than one line, indent the continuation. Do not use superfluous punctuation (commas, semicolons, etc.). Only one verb per line is allowed.

Sort Return. Check SORT-RETURN after all embedded sorts to verify the success of the sort.

Stop Run and Go Back. There may be only one STOP RUN/GO BACK Statement in each program. CICS Programs are exempt from this standard.

III. Compiler Considerations

A. Use the following compiler options if subprogram linkage is part of the design (on both calling and called programs):

1. DYNAM
2. RESIDENT

III. Compiler Considerations (continued)

B. The CA Optimizer should be used for all COBOL program development.

1. Programs should be compiled with the following CA Optimizer options:

a. DTECT - test and prod
b. XCOUNT - test
c. MLIST - test and prod
d. MDMAP - test and prod

2. All Optimizer compress Source Listings should be stored in a library allocated for that purpose by system, application, or agency.

## I. Introduction

ADS development guidelines provide a consistent method of developing online systems and help new development projects avoid the extra expense and time incurred while learning a new language.

The recommendations that follow are based upon the Release 10.2 of Cullinet software. These guidelines will be updated as new enhancements, program fixes, and releases are installed.

## II. General Development Considerations

A. **Productivity** - The programmer productivity features of ADS should always be used unless there is good reason (cost/benefit) to use solutions that require more person effort to develop and maintain. Some of the DBMS and Cullinet productivity tools are: Dictionary Module Editor (DME), Online Test, ADS/TRACE, TP/SORT, OLM edit modules, Built In Functions, Pageable Mapping and the use of the online IDMS Utility Functions available through **DBA01**. Use of these features may reduce development and maintenance costs.

B. **Use of ADS/A** - All new ADS online systems should use ADS/A. ADS/A is a powerful analytical tool when used to prototype systems and supports development from the prototype to a production system.

C. **Control Commands** - The ADS/A controller allows the removal of many interdialog control commands from the ADS/O source code. Keeping the control commands in the ADS/A controller allows system flow changes to be completed without source code changes and dialog recompilation.

D. **Naming Conventions and Abbreviations** - Follow the naming conventions and abbreviations described in the guideline for Database Design.

E. **Color** - Use color PC's or terminals whenever feasible. Colored fields help the terminal operator to quickly distinguish literals, data fields and fields that were incorrectly entered. Recommend colors and system default colors are as follows:

| | Recommended | System Defaults |
|---|---|---|
| literals: | green | green |
| data fields: | yellow | green |
| errors: | pink or red | red |
| highlighted: | N/A | white |

The recommended colors have been tested in a high volume production environment with relatively good success. Other combinations may be more suitable to your application, however, use caution when selecting color combinations as they may cause unnecessary eye strain for the terminal operator.

F. **Load Module Sizes** - Keep ADS/A applications and ADS/O dialog load module (FDB) sizes less than 40K. This value can be found on the ADS/O report and with the display load module in IDD.

G. **Subschema Definitions** - Tailor database subschemas to match the information requirements of each program or group of programs. Subschemas for dialogs that perform IDMS store commands should have the entire record description defined to the subschema.

H. **Menu Control** - Accept any database key information and the activity (add, change, delete, or inquire) at the menu level, before passing control to an update or inquiry program. Capturing this information at the menu level greatly reduces complexity of lower level dialogs.

I. **Dialog Design** - Perform inquiry and update functions in separate dialogs. Consider separating the update functions ADD, CHANGE, and DELETE when any of the following situations exist for your application:

1. The edit criteria varies significantly for each function.

2. Large amounts of code are unique to each function; thereby, loaded but not executed depending on the function requested.

3. The processing becomes complex and difficult to maintain.

J. **PF Key Assignments** - Attempt to standardize PF key assignments to other applications. Use the following:

PA1 - Reserve for printing
PF1 - Help
PF2 - Pop
PF3 - Pop Top
PF7 - Page backward (up)
PF8 - Page forward (down)
CLEAR - To leave the application

K. **Screen Design** - use the following screen design conventions:

- Screen identification (for support purposes) will always be in the upper left corner. The map name serves as a good identifier.

- Screen title will always appear centered on the top line.

- System date and time will appear on the top line in the right corner.

- The error message line appears on the bottom line of the screen.

K. **Screen Design** (continued)

- The PF key descriptions and the RESPONSE field appear on the lines immediately above the error message line.
- Pageable screens should have a page number.
- Pageable screens should not be used for updates.

L. **Map Records** - All map records should begin with the map name, followed by MAP-REC. (AMTR4000-MAP-REC)

All data elements within a map record should be prefixed with 'M' and the dialog number, i.e., M4000-MEMB-SSN. Only one (1) map record should be used for each map.

M. **Work Records** - All work records should be prefixed with the dialog name followed by WORK-REC. (AATR4000-WORK-REC)

All data elements within a work record should be prefixed with 'W' and the dialog number, i.e., W4000-MEMB-SSN. Only one (1) work record should be defined for each dialog.

All dialogs will need to define the ADSO-APPLICATION-GLOBAL-RECORD as a work record.

N. **Security** - Use the ADS/A security scheme established and maintained by the Database Design and Administration Section of the Systems Development Bureau. If there are more complex, data dependent requirements, the application will need to provide for them.

III. ADS/A Development Guidelines

A. **Function and Response Design** - When creating a prototype or test application, it is strongly recommended that the function and response flow be first drawn on paper before working in ADS/A. When an acceptable flow has been designed define the responses to ADS/A and skeleton functions will be created by the system. Application definition 'on the fly' can be very expensive and is likely to be error prone.

B. **Application Size** - Keep your application small and functionally independent. Large applications (200 responses or more) are very difficult to maintain and expensive to generate. A system may be divided into multiple applications without any user inconvenience by using the 'LEAVE APPLICATION NEXT TASK' command. Security information, database record keys, etc., may be passed from one application to another through the use of SCRATCH records.

C. **Mixing ADS/O and ADS/A Control Commands** - Do not mix ADS/O and ADS/A control commands. ADS/A cannot keep track of ADS/O control commands. ADS/A will be pointing to the last function it issued, regardless of any ADS/O control commands issued.

D. **Transfers** - Use transfers whenever possible.

E. **INVOKES and LINKS** - If LINKS and INVOKES must be used, you should not extend more than three levels. Always attempt to extend the run-unit by using the same subschema in both dialogs. Use the NOSAVE option if you do not need currencies restored.

F. **Nesting** - Avoid nesting multiple ADS/O dialogs under one ADS/A function. In other words, define an ADS/A function for each ADS/O dialog in your system. This will make your system much more visible at the Application level and help you avoid mixing ADS/O and ADS/A control commands.

G. **Passing Command Information** - The ADSO-APPLICATION-GLOBAL-RECORD should be used to pass common application information from function to function. Create your own global record to pass information that is unique to your application. Keep this record small since it remains in storage as long as the application is executing.

H. **Version Numbers** - Always specify version number when defining global records to an application. They will not work if omitted.

IV. ADS/O Development Guidelines

A. **Program Structure** - The ADS/O programming language lends itself nicely to the structured programming approach currently used in COBOL. Use the SUBROUTINE CONTROL COMMANDS (CALL, DEFINE SUBROUTINE, and GOBACK) to create a modular program. Prefix or suffix the subroutine names with an alphabetic sequentially assigned character to make the subroutine easier to locate.

B. **Subroutine Documentation** - Always include a documentation block before each subroutine. Unlike COBOL the eight character subroutine names do very little to describe the code being executed.

C. **Module Design** - Separate your program into independent logic groups (i.e.: data retrieval logic, edit logic, and update logic). Should the program exceed the recommended limit of 40K, large blocks of code may be removed from the dialog, inserted in a mapless dialog, and executed via a link command.

D. **Subroutines** - Name subroutines as close to COBOL paragraph naming conventions as possible. Because of the limit of eight (8) characters in a subroutine name this may be difficult at times. To make things easier, use only one (1). Hyphen between the prefix and the subroutine name.

i.e.: C11-ACCT
(NOT) C-1-1-AC

Use subroutines when accessing multiple records. When using subroutines in this manner use the standard prefix and the database record suffix as the subroutine name.

i.e.: C-CTSUM
B1-RTSEP

IV. ADS/O Development Guidelines (continued)

D. **Editing**

1. Use the OLM edit and encode/decode tables whenever possible. Do not link the tables to the map, as this will require a recompile of the map whenever the table is modified.

2. The MAP MODIFICATION COMMANDS and the MAP FIELD STATUS CONDITION commands in conjunction with the EXTENDED INITIAL DEFINITION SCREEN (OLM-PF9) are extremely helpful when writing edit logic. Use the MODIFY MAP ... EDIT IS ERROR command to flag any fields that do not pass your edit requirements. At the end of your edit logic, use the IF ANY FIELDS ARE IN ERROR command to verify that all edits have been passed before performing the update logic. Specify the attributes of the incorrect fields on the EXTENDED INITIAL DEFINITION SCREEN (highlight, MDT, and pink or red are recommended). The attributes for correct fields will default to the definition of the data field and should not need to be altered in most applications.

E. **Error Handling** - Three different methods of issuing error messages are commonly used. Any one or a combination of the three may be used depending on the complexity of the application and the users involved.

1. A general error message. 'CORRECT HIGHLIGHTED FIELDS', 'CORRECT FIELDS IN RED', etc.

2. An error message may be specified for each data field in the text message of the EXTENDED FIELD EDIT SCREEN (PF10) on the map. The messages for all fields modified EDIT IS ERROR will then appear in the $MESSAGE field when the next DISPLAY command is executed. Never use an apostrophe in the text message. The apostrophe will terminate the batch map compiler.

IV. ADS/O Development Guidelines (continued)

E. **Error Handling** (continued)

3. An array equal to the size of the $MESSAGE field may be defined in working storage. Each individual error message can be moved to the next available array position as an error is encountered. At the completion of the edit logic the entire array should be displayed. This method is similar to method 2, but it allows more specific messages to be issued when a field is subject to multiple edits. The $MESSAGE field length defaults to 80 characters but may be altered by keying the desired field length into the SUB field on the field definition screen in OLM.

F. **Online Mapping**

1. Use automatic editing to reduce editing in the process modules. Enable automatic editing for each field by specifying 'Y' in the edit option on the field edit screen.

2. Do not use the ERASE EOF, INSERT, or DELETE KEYS when building a map.

3. Use the database records as map records for inquiry screens. In most cases database records should not be used as map records for update screens.

4. Specify the delimit as S (skip) or Y (yes) on all data fields. N (no) is the default and will allow entry of data beyond the end of the field.

5. Do not use the REQUIRED Indicator on the EXTENDED FIELD EDIT SCREEN (PF10). It requires entry into the field after every screen display whether the field is correct or incorrect.

IV. ADS/O Development Guidelines (continued)

F. **Online Mapping** (continued)

6. Always specify that the MDT should be set on for all fields in error (EXTENDED INITIAL DEFINITION SCREEN) to insure that incorrect fields are re-edited. The modified data tag (MDT) indicates whether or not information has been entered into a specific field. This indicator can be tested and altered in the program logic. Use this indicator to test that a field has been entered or changed before subjecting it to numerous (possibly unnecessary) edits. The modified data tag is reset with each DISPLAY, and should not be used to determine whether a field should be updated on the database. Two or more displays of the same screen may be necessary before an entire screen of information is correct. Only the last fields entered will have their modified data tags turned on. A more reliable method is to compare the map field to the database field.

7. A pad character should be specified for all alpha-numeric data fields and the zero option on all numeric fields. During a data entry session, if the erase end of field key (EOF) is pressed in a data field, the attributes of the field will be set to MDT on, LENGTH = -1. If a pad character or the zero option is not specified for a data field, nothing will be passed to the map field on output and the field will contain the same information that was previously mapped out.

8. When prototyping, define each field separately to allow for easier definition of data fields at development time.

IV. ADS/O Development Guidelines (continued)

G. **Paging** - Use the pageable map facility in OLM whenever possible. As of this writing (August 1989) it is not advisable to use this facility to update the database.

SCRATCH records are extremely helpful if the pageable map facility is not used. Write each map record as it is built to the SCRATCH area using the page number as the RECORD ID. When the terminal operator requests the previous page, subtract one from the current page and retrieve the page from the scratch area. All information displayed on the map must be defined in a map record.

H. **88 Levels** - Do not use multiple values in an 88 level condition statement; ADS/O will only recognize the first occurrence.

I. **READY Command** - Do not use the PROTECTED or EXCLUSIVE options of the READY command unless absolutely necessary. These may cause data contention problems when multiple terminal operators try to access the same information. Ready each area individually.

J. **Source Code Editor** - Use DME for source code editing.

K. **Integrated Data Dictionary (IDD)**

1. Use the DELETE/ADD commands to change edit tables or code tables when using in IDD.

2. Use the MODIFY commands to change ADS/O source code when using IDD. This method is significantly cheaper than the DELETE/ADD.

3. Do not press PF6 when using the online IDD editor until you are ready to update the module, record, etc.

L. **Leading Zeroes** - Be aware that ADS/O moves will replace leading zeroes with spaces and right justify when moving a numeric field to an alpha field. COBOL moves are the default.

IV. ADS/O Development Guidelines (continued)

M. **$MESSAGE** - Be aware that only the $MESSAGE field will be transmitted to the map when one or more fields are MODIFIED EDIT IS ERROR. Fields that are flagged in error will be altered as specified on the EXTENDED INITIAL DEFINITION SCREEN (PF9). All other fields will remain as they were on the last DISPLAY.

N. **Use of Periods** - Always complete a DO or REPEAT command with a period. The ADS/O compiler will not issue a syntax error when the period is omitted, but the compiler may not interpret the commands correctly.

O. **INITIALIZE Command** - Use the INITIALIZE command to clear a database, map, or work record instead of MOVE commands. ADS initializes records used by the dialog except if the record is specified at a higher level (invoke or link) or the dialog uses a display continue.

P. **AUTOSTATUS Command** - Use AUTOSTATUS (the default) to check your database record status. Use the ALLOWING ERROR CODES extension of the database commands to check for status codes not specified in the AUTO-STATUS record.

Q. **Version Numbers** - Specify the version number of the dialog, records, and processes when adding or maintaining dialogs in the Application Development System Generator (ADSG). The ADS/O report program has trouble locating the source code for some of the response processes when version is omitted.

R. **EXECUTE ON EDIT ERRORS Prompt** - The EXECUTE ON EDIT ERRORS prompt on the RESPONSE PROCESS DEFINITION SCREEN of ADSG should be set to NO (the default) in most response processes. This will keep invalid data from being passed to the map record. YES should only be used to allow the terminal operator to exit the application.

S. **EOF Key** - To allow use of the erase end of field key (EOF) in a field that is edited by an edit or code table, define '' as a valid table entry.

IV. ADS/O Development Guidelines (continued)

T. **PRODUCTION MIGRATION** - Use the MIGRATE selection in **DBA01** to migrate dialogs, maps, tables and applications to production. Turn the Symbol Table and Diagnostic Tables off before migrating dialogs to production.

I. Introduction

Source code for all production software (COBOL, ADS, CULPRIT) should be maintained in PANVALET.

II. Procedures

A. **COBOL programs** - The procedures to be used when developing or modifying a program are detailed below. This section includes all procedures necessary for a program that had previously been placed into production. For new program development, disregard all steps that do not apply.

- Check the current daily Panvalet listing for versions other than production or disabled.
- Copy the production version to a test version in Panvalet (SPF 8.5).
- Retrieve the test version from the Pan Library to your SPF Library (SPF 8.1).
- Apply the program changes as required by the Program Change Request (PCR).
- Store the new test version in the Pan Library (SPF 8.2). Always compile from this copy, not the SPF library copy.
- If at any time during the course of modifying a program it is determined that the changes should not be implemented, rename the program to a disable suffix and disable.
- Obtain test output approval from Unit Leader and Customer.
- Rename the production version to a disabled version and disable (SPF 8.8 Rename; SPF 8.4 Change).

A. **COBOL programs** (continued)

- Rename the test version to the production version and change the status to prod (SPF 8.8 Rename; SPF 8.4 Change).
- For all panvalet operations, be sure to update the panvalet user-ID with your man number or the project man number (SPF 8.4 Change).
- Be sure the comment record is correct (SPF 8.4 Change). (Always use the TSO CLIST to assure a comment record is added with every new program.)
- Always verify that each panvalet command completes successfully.
- Status should be changed to inactivate on panvalet and the comments changed to reflect its inactive status for one time programs or removal of programs from a system.

B. **Culprit programs** - Production status culprit source code will be maintained in PANVALET using the source code maintenance procedures outlined for COBOL source code. A Culprit procedure has been developed that retrieves the PANVALET source as input to the Culprit process.

C. **ADS modules** - Use the PANVALET version of the migration software to migrate dialogs, maps, and tables.

D. **Non-Database File Descriptions** - A PANVALET file layout must be available for any file that is passed from one program to another.

III. Naming Conventions

A. **PANVALET Libraries** should follow one of the following conventions:

FNN.PANLIB - where NN is the agency node

FNN.SSS.PANLIB - where NN is the agency node and SSS is the system mnemonic. This option is advisable when security of source code is desireable at the system level rather than the agency level.

B. **Batch Programs** - Use the full ten (10) bytes allowed to uniquely identify each program and its status. There are four (5) levels established, each of which identifies the function of the program. The structure is as follows:

| SSSXYZZZSF | where: |
|---|---|
| SSS: | Major system identifier (CSE, PPP, DWC, SBS, etc) |
| X: | Subsystem Identifier (1=Personnel, 2=Payroll, 3=Position Control) |
| Y: | Function Identifier (0=Temporary, 1=Control, 2=Edits, 3=Updates, 4=Interfaces, 5=Reports, 6=Sorts, 7=Misc., 8=System Support |
| ZZZ: | Program Identifier - unique number within the first three levels |
| SF: | Suffix (see suffix conventions below) |

C. **Online Programs (and components)** - All ADS components should follow the conventions identified in Section 7 of the ADS Application Design Guide.

III. Naming Conventions (continued)

D. **Subroutines** - Subroutine members should follow the following naming conventions:

| | |
|---|---|
| SSXXXXXXSF | where: |
| SS: | Major system identifier (CS, PP, DW, SB, etc.) |
| XXXXXX: | Subroutine identifier - unique identifier with some meaning if possible (DTERR - Date Error routine, WJOBST - working storage data elements group job status routine) |
| SF: | Suffix (see suffix conventions below) |

E. **File Layouts** - File layout members should follow the following naming conventions:

| | |
|---|---|
| SSXYYYYYSF | where: |
| SS: | Major system identifier (CS, PP, DW, SB, etc) |
| X: | Unique character assigned within major system to designate file definitions from all other panvalet includes (F - File Definitions, R - Record Definitions) |
| XXXXX: | Subroutine identifier - unique identifier with some meaning if possible (DTERR - Date Error routine, WJOBST - working storage data elements group job status routine) |
| SF: | Suffix (see suffix conventions below) |

III. Naming Conventions (continued)

F. **Suffix** - In all cases (COBOL source code, subroutines, file layouts) use one the following:

- **(Production).** The final, tested version of a program should be renamed to the associated program number (with no suffix) to indicate that the program has been placed into a production status.

**Tn - (Test).** All new programs that are under development or existing programs that are undergoing modifications should carry a 'T' suffix. The 'T' suffix should not be used for production processing. In some instances, multiple versions will have to exist at the same time. In this case, use 'n' to distinguish the multiple version (1-9).

**Dn - (Disabled).** A program that is no longer needed should carry a 'D' suffix. A disabled program is of no further use and can be moved to the Panvalet Disabled Tape where it is subject to a physical delete from the Panvalet System. In some instances, multiple versions will have to exist at the same time. In this case, use 'n' to distinguish the multiple version (1-9).

**Pn - (Prototype).** A program that is in development under a prototyping method. The 'n' can be used to note the level of the prototype (P1 -Level 1 Prototype, P2 - Level 2 Prototype).

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I. Introduction

JCL procedures for all production applications systems should be maintained in EASYPROCLIB procedure libraries.

II. Naming Conventions

A. **JCL Procedure Libraries** should follow one of the following conventions:

FNN.UPROCLIB - where NN is the agency node

FNN.SSS.UPROCLIB - where NN is the agency node and SSS is the major system identifier. This option is advisable when security of the catalog procedure is desireable at the system level rather than the agency level.

B. **Procedure Library members** - Use the full eight (8) bytes to uniquely identify each procedure and its status.

SNNXXXY1 where:

S: Designates status (P - Production, T - Test, D - Disable)

NN: Numeric portion of the agency node (00 - ISD, 01 - Accounting, 05 - Health)

XXX: Unique assignment to categorize procedures. If the system is heavily cyclic use the following:

100 - Daily
110 - Weekly
120 - Monthly
140 - Annual-Fiscal Year
150 - Annual-Calendar Year
160 - Request Basis Reporting
170 - Request Basis Updating

Y: Character

1: Sequential number (optional)

## Appendix A. DEFINITION OF TERMS

The following are definitions of some of commonly used terms in the computer processing field:

**(RESERVED FOR FUTURE USE)**

## Appendix B. SYSTEM COMPONENT CODES

The following System Component Codes are used in the Job Statement to identify the component used to submit a job.

**T** Operations Section local reader submitted jobs - testing for ISD I/O Services Section.

**J** Operations Section local reader submitted jobs - production for ISD I/O Services Section.

**E** Operations Section local reader submitted jobs - external users, i.e. users not employed in the ISD I/O Section.

**C** TSO submitted jobs.

**R** RJE submitted jobs.

**K** CICS submitted jobs.

## Appendix C. AGENCY AND GROUP IDENTIFIERS

The following Agency and Group Identifiers are used in the Job Statement to identify the Agency or Group submitting a job. These identifiers are assigned by the Information Services Division.

| | |
|---|---|
| A | Department of Administration - Systems Development Bureau |
| B | Department of Health and Environmental Sciences |
| C | Department of Commerce |
| D | Department of Labor and Industry |
| E | Department of Labor and Industry - Employment Security Division |
| F | Department of Fish, Wildlife and Parks |
| G | Governor's Office |
| H | Department of Highways |
| I | Department of Institutions |
| J | Department of Justice |
| K | Department of Agriculture |
| L | Legislature - Legislative Council, Legislative Fiscal Analyst, Legislative Auditor |
| M | Department of Administration - Personnel Division, Board of Investments, Board of Housing, Accounting |
| N | Department of Natural Resources and Conservation |
| P | Superintendent of Public Instruction |
| Q | Department of Livestock |
| R | Department of Revenue |
| S | Department of Social and Rehabilitation Services |
| T | Office of the Secretary of State |
| U | Supreme Court |
| V | Department of Administration - Public Employees Retirement Division |
| W | Other |
| X | Department of Administration - Operations Bureau, Resource Management Unit, Information Center Bureau |
| Y | State Auditor's Office - Central Payroll Division |
| Z | Department of Administration - Technical Services Bureau |
| | |
| 0 | University System - General |
| 1 | Eastern Montana College - Billings |
| 2 | Montana State University - Bozeman |
| 3 | Montana Tech - Butte |
| 4 | Western Montana College - Dillon |
| 5 | Northern Montana College - Havre |
| 6 | University of Montana - Missoula |

## Appendix D. JOB CONTROL LIMITS AND DEFAULTS

### JOB STATEMENT - KEYWORD PARAMETERS

1. **ADDRSPC** - 640K
2. **CLASS** - A
3. **MSGCLASS** - 9 for jobs submitted via TSO
   - A for jobs submitted by any other method
4. **MSGLEVEL** - 1,1
5. **PRTY** - 1
6. **REGION** - 640K
7. **TIME** - 5 seconds on class H jobs only, no default for other jobs

### JOB CARD - OPERATION CODES

The Operation Code is a two byte field. The first byte controls whether the operator is prompted in the event the allotted CPU time for a job or job step is exceeded. The second byte controls the format of the EXCP BY UNIT section of the step termination boxes.

Valid Operation Codes

| Byte-1 | Byte-2 | |
|---|---|---|
| P | | The computer operator will be prompted to extend CPU time if the CPU time for the job or job step is exceeded. The decision as to whether the CPU time is extended, the amount of the extension, and the number of extensions given rests with the operator. This option is provided for special or unforeseen circumstances; such as instances where processing time cannot be accurately predicted. It is policy to cancel jobs which prompt for additional CPU time unless special circumstances have been communicated to the Central Computer Operations Bureau. |
| C | | The job will be cancelled if the CPU time limit for the job or job step is exceeded. The operator will not be prompted. |
| | S | Requests a summarized EXCP BY UNIT section it the step termination boxes. The Unit Address and EXCP count are displayed for each DD statement used. |
| | D | Requests a detailed EXCP BY UNIT section in the step termination boxes. The DDNAME, Maximum Block Size used, Unit Address, and EXCP count will be displayed for each DD statement. |

JOB CARD - OPERATION CODES (continued)

Valid Operation Codes

| Byte-1 | Byte-2 | |
|---|---|---|
| | N | Requests that no EXCP BY UNIT section be produced. |

EXEC STATEMENT - KEYWORD PARAMETER DEFAULTS

1. **ADDRSPC** - 640K
2. **REGION** - 640K
3. **TIME** - 1 minute

DD STATEMENT - KEYWORD PARAMETER DEFAULTS AND ACCEPTABLE VALUES

1. **OUTLIM** - 40,000 lines. The job is not canceled but warning messages are issued for every 10,000 lines in excess of the default.

2. **UNIT** - The following are valid ISD assigned group names:

   a. **TAPE** Default is 6250 BPI.

   b. **TAPELO** 800 BPI tape.

   c. **SYSDA** Direct access dataset retained only for the duration of the job.

   d. **TEMPSTOR** Direct access dataset retained for eight days from the last date used or for 24 days from the date of creation, whichever is earlier.

## Appendix E. MAINFRAME APPLICATION SOFTWARE

The following mainframe software is installed and supported to the indicated level by the Information Services Division. Software products are grouped by support level.

### FULL SUPPORT MAINFRAME SOFTWARE

ACF/2-Access Control Facility/2
ADS/O-Application Development System/Online
BMS-GT
BTP-Batch Transfer Program
CICS/CEMT
CICS/Command Level
VS COBOL
CULPRIT
DCF-Document Composition Facility
Developer Tool Kit
DISOSS (V3)-Distributed Office Support System
DYLDOC
DYLSORT
DYL260
EasyProcLib
FORTRAN VS
GENX
IDMS/IDD-Integrated Data Dictionary
IDMS/CV-Integrated Data Management System/Central Version
INTERTEST
OLQ-Online Query
OPTIMIZER III
PANLINK
PANVALET
PANVALET/TSO
PM-Personal Manager
SAS-Statistical Analysis System
    SAS/FSP Full Screen Product
    SAS/ETS Econometric Time Series
SCRIPT VS
SDSF-Spool Display and Search Facility
SYNCSORT
TSO/ISPF-Time Sharing Option/Interactive Structured Programming Facility
IDMS/UCF-Universal Communications Facility
VPS-VTAM Printer Support
VSAM-Virtual Sequential Access Method

Appendix E. MAINFRAME APPLICATION SOFTWARE (continued)

LIMITED SUPPORT MAINFRAME SOFTWARE

BASIC (VS)
CICS/Macro Level
CICS/SYSD-Debugging Tool
FS CALC (SAS)
ICIDU-Diskette Reader
IIPS-Interactive Instructional Presentation System
PC/70-Project Control/70
TPL/PLL-Table Producing Language
TYPSET II
ZCHART
ZETA FUNDAMENTAL SUBROUTINES
ZETA FUNCTIONAL SUBROUTINES

SUNSET SUPPORT MAINFRAME SOFTWARE

DAS (DATA ADMIN)-Flowcharting Tool (no replacement)
DITTO/OS
DYL250 (replaced by DYL260)
FORTRAN G
ISAM-Indexed Sequential Access Method
MARK IV
MSUSTAT (replaced by SAS)
SPSS-Statistical Package for Social Services
(to be replaced by SAS)

SPECIAL CASE MAINFRAME SOFTWARE

ALPHA SEARCH
ALTER
INS
PL1
SYSM
TYPE

## Appendix F. MICROCOMPUTER APPLICATION SOFTWARE

The following microcomputer software is installed and supported to the indicated level by the Information Services Division. Software products are grouped by support level.

### FULL SUPPORT MICROCOMPUTER SOFTWARE PRODUCTS

CROSSTALK XVI
LOTUS 1-2-3
MS/DOS & PC/DOS
PC/SAS including STAT and GRAPH
PS/PC-Personal Services/Personal Computer
WordPerfect
RBase
Freelance Plus
Novell Netware
Attachmate Entry and Extra
IBM PC LAN Program
PFS: Professional File
IDMS/ARCHITECT
TAB - The Application Builder
ENTERPRISE/GENERATOR/PC

### LIMITED SUPPORT MICROCOMPUTER SOFTWARE PRODUCTS

dBase
Novell SNA products

### SUNSET SUPPORT MICROCOMPUTER SOFTWARE PRODUCTS

IBM 3270 Emulation/Entry Level
IBM 3270 Emulation/Version 3.0

### SPECIAL CASE MICROCOMPUTER SOFTWARE PRODUCTS

OS\2 Extended Edition
OS\2 Lan Server
Automax

| | | | |
|---|---|---|---|
| POLICY: | Information Systems Development | Section #: | 1-12401 |
| STANDARD: | | #: | |
| PROCEDURE: | | #: | |
| GUIDELINE: | | #: | |
| | | PUB. DATE: | 09/21/89 |
| | | REVIEW DATE: | |
| | | PAGE: | 1 OF 1 |

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I. Policy

A systematic approach will be used to develop quality, cost-effective State information systems. The specific method used must be approved by agency management and provide a structure for planning and monitoring project progress.

## I. Introduction

The System Development Method presented in this section is a guideline for system development. The guideline provides a flexible framework within which systems development projects can be planned, designed, and developed. The method will help programmer/analysts plan and manage their projects.

## II. Guideline

This guideline consists of three phases. The tasks performed in each phase, the documentation produced, and the accomplishments will vary from project to project. This guideline provides a list of items from which to pick and add as necessary for each project.

A. **Preliminary Analysis** - The Preliminary Analysis should result in definition of the scope and objectives of the project, a statement of the business and system requirements, and a preliminary plan for proceeding with the project.

In addition to the formal and informal documentation produced in this phase, several less tangible accomplishments are achieved. The project team develops an understanding of the customer's business environment, problems, needs, and functional requirements. The customer gains an understanding of the commitment and responsibility for developing and managing a system.

The tasks normally performed during this phase include:

- study the user's current business environment
- identify the user's business requirements
- identify the system requirements
- develop a logical database design
- develop cost projections
- identify quantifiable benefits
- gain formal concurrence
- assure quality

A. **Preliminary Analysis** (continued)

The documentation produced include a memo or report documenting the results of the analysis including project scope and objectives, business needs, system requirements, cost/benefit, a recommendation of how to proceed and preliminary plans for the remainder of the project. Working papers should also be produced to document the following:

- current processes and systems used
- interviews
- meetings
- logical data relationships
- estimates.

B. **Software development** - During the software development phase, prototyping is an effective technique to use to refine requirements and design and develop a solution. The prototype is an executable model that demonstrates the functionality of the system and provides a tangible means of communicating with the user to define requirements. Prototyping should be done in levels, each level adding more depth of processing until the full system is ready for acceptance testing.

The tasks normally performed during the software development phase include:

- support user activities
- design database and files
- design system flow
- design online functions
- design batch reporting
- test, review, refine
- define processing requirements
- estimate costs and benefits
- review and monitor cost estimates
- define and design conversion software
- develop unit and system test plans
- code and test each program module

B. **Software development** (continued)

The Level 1 prototype should demonstrate the functionality of the system and provide a tangible means of communicating with the user to define requirements. It includes menus, on-line screens, and navigation among functions. Some batch output reporting should be defined.

The Level 2 prototype should demonstrate data access and manipulation with on-line processes complete except for integrity, security, editing, and detailed processing requirements. The physical database design should be complete except for performance tuning.

The Level 3 prototype includes definition and implementation of integrity, security, editing, and detailed processing requirements and completion of the batch portions of the software.

The deliverables from this phase include the following:

- technical design and support documentation including:
  - System Flowcharts
  - Database schema, subschema, record, and data element definitions
  - File Definitions
  - Program Specifications
- system software including:
  - System that is ready for system testing by SDB and the user
  - Program source and object code
  - Job Control Language and cataloged procedures for job execution
  - Utility control statements
- procedural documentation
- Operating instructions

In addition, an impact statement identifying considerations for the Central Computer Operations Bureau and a test plan should be produced during this phase. Also, one-time software for supporting the testing process and/or converting data should be developed as necessary.

B. **Software development** (continued)

The user also performs some important tasks during the software development phase including:

- Plan system test
- Draft user's manual
- Plan implementation
- Prepare disaster recover plan
- Plan security
- Plan training

The project team performs tasks which assure that the work completed during this phase is correct and meets standards and specifications. This is accomplished by team member walkthroughs and reviews.

C. **System Test and Installation** - During this phase both the development team and the user should test the system to insure that the system meets the user's functional business specifications before and after installation.

The tasks normally performed include:

- perform development team system test
- conduct user system testing
- install software
- support automated conversion of data
- review, update, and finalize technical support documentation
- transfer system responsibility to customer

The deliverables of this phase are the technical design, support documentation, and production software.

The results of this phase are that the project team and the customer find the majority of the errors and discrepancies and make the necessary changes. The customer also develops expertise throughout the testing process and is better prepared to assume responsibility for the management of the production system.

| | | | |
|---|---|---|---|
| POLICY: | Composition and Function of the State Records Committee | Section | 1-12501 |
| STANDARD: | | #: | |
| PROCEDURE: | | #: | |
| GUIDELINE: | | #: | |
| | | PUB. DATE: | 09/21/89 |
| | | REVIEW DATE: | |
| | | PAGE: | 1 OF 1 |

I. Policy

The State Records Committee is composed of representatives from the Department of Administration, Office of the Legislative Auditor, Office of the Attorney General, the Montana Historical Society and the Secretary of State.

A. The Committee will:

1. establish authoritative standards, procedures and guidelines for public records retention.

2. promote sound records management practices throughout State government.

B. This Committee shall meet at least quarterly to approve or disapprove:

1. the recommendations on retention schedules of all public records.

2. agency requests to dispose of such public records.

II. Authorization

The State Records Committee is authorized by law, Sections 2-15-1013 and 2-6-204, M.C.A.

III. Definitions

There are numerous definitions needed in the records management field. The most frequently used terms are defined in alphabetic order in Appendix A of **Public Records Management 1-12502.**

| | | | |
|---|---|---|---|
| POLICY: | Public Records Management | Section | 1-12502 |
| STANDARD: | | #: | |
| PROCEDURE: | | #: | |
| GUIDELINE: | | #: | |
| | | PUB. DATE: | 09/21/89 |
| | | REVIEW DATE: | |
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I. Policy

A. Ownership of Public Records - All public records are and shall remain the property of the State. They shall be delivered by outgoing officials and employees to their successors and shall be preserved, stored, transferred, destroyed, or disposed of and otherwise managed only in accordance with the provisions of this part.

B. Public Records Management - In order to ensure the adequate protection and preservation of the State's public records the Department of Administration will be responsible for:

1. creating an effective records management program for Executive branch agencies.

2. providing records management services to Executive branch agencies.

3. providing records management advice and assistance to the Legislative and Judicial branches when requested.

4. providing records management services, similar to those available to the Executive branch, to the Legislative and Judicial branches when requested.

II. Authorization

The Department of Administration services are authorized by the "Public Records Management Act", Sections 2-6-201 through 2-6-213, and 2-15-1013, M.C.A.

III. Definitions

There are numerous definitions needed in the records management field. The most frequently used terms are defined in alphabetic order in Appendix A.

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|---|---|---|---|
| POLICY: | Public Records Management | Section | 1-12502 |
| STANDARD: | Agency Management of Public Records | #: | 01 |
| PROCEDURE: | | #: | |
| GUIDELINE: | | #: | |
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I. Agency Administration of the Records Management Function

A. Each Executive branch agency of State government will coordinate all aspects of the agency records management function and shall:

1. manage the inventorying of all public records within the agency for disposition, scheduling, and transfer action in accordance with procedures prescribed by the Department of Administration and the State Records Committee.

2. analyze public records inventory data and compare divisional or unit inventories for duplication of records.

3. recommend to the Department of Administration and the State Records Committee minimal retention periods for each copy of public records within the agency.

4. approve all records disposal requests which are submitted by the agency to the State Records Committee.

5. review established records retention schedules to insure that they are complete and current.

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|---|---|---|---|
| POLICY: | Public Records Management | Section | 1-12502 |
| STANDARD: | Protecting and Preserving Public Records | #: | 02 |
| PROCEDURE: | | #: | |
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I. Protection and Preservation of the Executive Branch's Public Records

The Department of Administration shall provide adequate protection and preservation of the State's public records by:

A. establishing guidelines for inventorying, cataloging, retaining, and transferring all public records of State agencies.

B. reviewing and analyzing all State agency filing systems and procedures and approve filing system equipment requests.

C. establishing and operating the state records center, as authorized by appropriation, for the purpose of storing and servicing public records not retained in office space.

D. gathering and disseminating information on all phases of records management, including current practices, methods, procedures, and devices for the efficient and economical management of records.

E. operating a central microfilm unit which will microfilm, on a cost recovery basis, all records approved for filming by the office of origin and the Department of Administration.

F. approving microfilming projects and microfilm equipment purchases undertaken by all state agencies.

II. Services Available to the Legislative and Judicial Branches

Upon request, the Department shall assist and advise in the establishment of records management procedures in the Legislative and Judicial branches of State government and shall, as required by them, provide services similar to those available to the Executive branch.

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| POLICY: | Public Records Management | Section | 1-12502 |
| STANDARD: | Protecting and Preserving Public Records | #: | 02 |
| PROCEDURE: | Protection of Public Records | #: | 01 |
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I. Designating Certain Public Records as Essential for the Continuity and Preservation of Civil Government

Each elected and appointed officer of the Executive branch of State government shall provide for the continuity of civil government. This will be accomplished by:

A. designating certain public records as essential records needed for an emergency or for the reestablishment of normal operations after any such emergency.

B. forwarding a list of such records to the Department of Administration where it will be securely stored as a backup copy.

C. periodically reviewing the list to insure its accuracy.

D. forwarding any changes or revisions to the list to the Department of Administration where it will be filed with the original list.

II. Safeguarding Certain Public Records for the Continuity and Preservation of Civil Government

Each elected and appointed officer of state government shall insure that the security of essential records is accomplished by the most economical means possible. This will be achieved by one or a combination of the following:

A. vaulting the essential records.

B. planned or natural dispersal of copies.

C. storage of the essential records in the State archives.

D. any other method approved by the Department of Administration.

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|---|---|---|---|
| POLICY: | Public Records Management | Section | 1-12502 |
| STANDARD: | Protecting and Preserving Public Records | #: | 02 |
| PROCEDURE: | Protection of Public Records | #: | 01 |
| GUIDELINE: | Reproduction of Essential Records | #: | 01 |
| | | PUB. DATE: | 09/21/89 |
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I. Reproducing Essential Records

Each elected and appointed officer of state government may choose to reproduce essential records for added security. Reproductions may be made by one or a combination of the following:

A. photocopying.

B. copying magnetic tape.

C. copying to microfilm.

D. copying by any other method approved by the Department.

II. Preserving the Reproduced Records

The Department of Administration recommends that reproduced copies of essential records be managed and stored according to the **Protection of Public Records** procedure, #: 01.

I. Transfer of Public Records Not Required for the Current Operation of the Office

All public records not required in the current operation of the office where they are made or kept shall be, in accordance with approved records retention schedules, either:

A. transferred to the State Records Center.

B. transferred to the custody of the state archives if such records are considered to have either:

1. permanent administrative value.

2. historical value.

II. Transfer of Public Records for Services of the Executive Branch Which May Be Abolished or Discontinued

All public records for agencies, commissions, committees, or other activities of the Executive branch which may be abolished or discontinued shall be, in accordance with approved records retention schedules, either:

A. transferred to the State Records Center.

B. transferred to the custody of the state archives if such records are considered to have either:

1. permanent administrative value.

2. historical value.

III. Rights of Control and Access to Transferred Public Records

The State Records Center is only a custodian of agency records stored there. Agencies that transfer records to the State Records Center retain ownership of the records and all rights of control and access to them. Access to stored records may only be obtained by:

A. approval of the owner agency.

B. presenting a subpoena for access to the owner agency.

IV. Agency Retention (Non-Transfer) of Public Records

Agencies that do not transfer records as provided in an approved retention schedule shall, within 30 days, notify the Department of Administration of this decision and request a change in the schedule.

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| POLICY: | Public Records Management | Section #: | 1-12502 |
| STANDARD: | Disposal of Public Records | #: | 04 |
| PROCEDURE: | | #: | |
| GUIDELINE: | | #: | |
| | | PUB. DATE: | 09/21/89 |
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I. Requests for Disposal of Public Records

Requests for the disposal of public records shall be submitted to the State Records Committee by the agency that owns the records.

II. State Records Committee Review

The State Records Committee shall approve, modify, or disapprove each agency request to dispose of public records.

III. Approval of Disposal of Public Records

No public records may be disposed or destroyed without the unanimous approval of the State Records Committee.

## Appendix A. DEFINITION OF TERMS

The following are definitions of some of the more common terms used in the records management field:

"Access" means permission to use and reproduce records. May be limited or qualified (restricted) by the agency having legal custody of the records.

"Active Records" means records or materials which are maintained in the office of an agency for current daily operations and are referenced at least once per file drawer per month.

"Administrative Value" means the usefulness of records to an agency for carrying on its day-to-day work and future work.

"Aperture Card" means a standard size tabulating card into which a rectangular hole has been cut. A special adhesive is then applied around the cut-out area and is used to hold a microfilm image securely in place. The aperture card may be keypunched to permit mechanical retrieval.

"Appraisal of Records" means an analysis of all records within an office to determine their administrative, fiscal, historical, or legal value to that agency's operation.

"Archives" means a depository for records and information that have permanent historical value.

"Camera, Planetary" means a camera in which the film unit is suspended over a copyboard and is raised or lowered to achieve the desired reduction ratio. The documents remain motionless on the copyboard while that are filmed.

"Camera, Rotary" means a camera in which documents are transported through the machine by rotating belts, while the image is reflected by several mirrors to the lens of the camera.

"Camera, Step-and-Repeat" means a camera in which groups of documents are exposed in multiple rows upon a sheet of film. The camera automatically positions images on the film.

"Cartridge" means a plastic holder containing a roll of microfilm. The entire unit can be plugged into a microfilm reader.

"COM" means Computer Output Microfilm. The process of translating computer generated information directly into human readable language and recording it on microfilm.

"Cubic Foot" means that volume of paper records which will fill a space one foot high by one foot wide by one foot long. This is the basic measurement for paper record volumes.

"Custody" means the guardianship of records, whether it be physical or legal control of the records.

"Density" means the degree of contrast between the image and background area of microfilm. Density is expressed as a numerical equivalent and measured by a densitometer. (.8 to 1.35 is the accepted standard for density).

"Diazo Film" means a relatively slow film composed of AZO dyes that, in the presence of strong light and ammonia vapors, are capable of creating a positive image. Diazo film has a shorter life than silver film but is often used in duplicating silver microfilm because it is less expensive and is of a more scratch resistant material.

"Dispersal (of Records)" means the distribution of copies of records outside their office of origin.

"Document" means an object upon which information is written, transcribed or recorded.

"Duplicator" means a machine for reproducing copies of exposed film through a process of contact printing.

"Filing System" means the planned method of indexing and arranging records.

"Film Frame" means the area of film exposed to light through the camera optical system for one image.

"Fiscal Value" means the usefulness of records for the administration of an agency's financial obligations.

"General Schedules or General Records Retention Schedules" means schedules which set forth retention periods for records common to many or all offices in State government.

"Hard Copy" means an original document, a paper copy made from microfilm, or a computer generated printout.

Appendix A. DEFINITION OF TERMS (continued)

"Historical Value" means the usefulness of records for historical research; records which show an agency's origin, administrative development, and present organizational structure.

"Holdings" means all of the records in the custody of a given agency, organizational element, archives, or records center.

"Image" means reproduction of a subject through optics, whether it be looking at an object through lenses or the fixing of the object on film.

"Inactive Records" means records having a very low reference rate; usually these records are no longer needed in the office and are retained in a low cost storage area.

"Information Request" means reference service provided by the State Records Center, where specific information from records in storage is transmitted to the requestor.

"Inventory" means the listing of all record series files maintained by an office or department together with the collection of operational data concerning files, volumes, and locations.

"Jacket" means a transparent card (3x5, 4x6) of acetate, separated into chambers for inserting short strips of microfilm.

"Legal Unit" means the usefulness of records containing evidence of legally enforceable rights or obligations of government or citizens.

"Magnetic Tape" means a tape or ribbon of any material impregnated or coated with magnetic oxide or other material on which information may be placed in the form of magnetically polarized spots.

"Microfiche" means a sheet of film on which many micro-images of related information have been printed in columns or rows.

"Microfilm or Microfilming" means the photographic reproduction of a document on film. The document may be reduced anywhere from one-tenth to one-fortyeighth its original size, with such clarity that it can be enlarged back to its normal size without loss of detail.

"Microforms" means various types of microfilm images such as: rolls, jackets, fiche, etc.

Appendix A. DEFINITION OF TERMS (continued)

"Microstrips" means microfilm images up to 12" long contained in a plastic sleeve.

"Non-Records" means materials that have no usefulness or importance for the day-to-day administration of agency operations. Such things as telephone messages, routing slips, preliminary drafts and other messages of a non--policy nature are non-records.

"Public Records" means any paper, correspondence, form, book, photograph, microform, magnetic tape, computer storage media, map, drawing, or other document, including all copies thereof, regardless of physical form or characteristics, that has been made or received by a state agency in connection with the transaction of official business and preserved for informational value or as evidence of a transaction and all other records or documents required by law to be filed with or kept by an agency of the state.

"Public Records Management Act" means Sections 2-6-201 through 2-6-213, and 2-15-1013, M.C.A., which are designed to create an effective records management program for executive branch agencies of the state of Montana by establishing guidelines and procedures for the efficient and economical control of the creation, utilization, maintenance, and preservation of state records.

"Reader" means a device capable of enlarging micro-images to a size that can be read with the naked eye. The images are projected on a ground-glass screen.

"Reader-Printer" means a device that in addition to enlarging micro-images to a readable size can also make paper copies (readable size) of selected images.

"Record Series" means documents, volumes, or folders that are arranged under a single filing system, or are kept together as a unit because they relate to a particular subject, resulting from the same activity, or have a particular form.

"Records Center" means a centralized area for housing and servicing includes warehouse space for paper records and the central computer storage space for electronic records.

"Records Disposal" means the final placement of records, once they have served their purpose. This usually refers to destruction of records.

Appendix A. DEFINITION OF TERMS (continued)

"Records Disposition" means management planning and analysis to determine when records are no longer needed for current business. Determinations include: destruction, transfer to a records center, microfilming before destruction, or transfer to an archives.

"Records Management Program" means a comprehensive system that sets guidelines and procedures for the efficient economical control of records and information used and kept by agencies of state government.

"Records Officer" means that person designated by an agency to oversee and coordinate a records management program within that agency.

"Reference Date" means the frequency, within a given period of time, of use of a specific file or collection of items.

"Retention Schedule" means an itemized list of records series with the corresponding time periods for which they must be kept.

"Retrieval" means recovering of information or records, whether through machine retrieval, or by recalling records from storage.

"Roll Film" means finished microfilm retained and used in 100 or 215 foot length and kept in rolls.

"Scheduling" means the actual determination and writing of retention periods for records.

"Security Copies" means duplicates of records, stored in safekeeping facility, to provide backup for any records lost or destroyed.

"Silver Film" means film composed of silver halides which release free silver on exposure to light and developer. Silver film is used for original negatives and prints.

"State Records Committee" means a committee composed of representatives of the Department of Administration, Legislative Auditor, Attorney General, and the Montana Historical Society, to approve retention schedules for public records, approve records disposal, and to generally oversee a state wide records management program.

"Storage Cartons" means cardboard boxes provided by the Records Management Section, specifically designed to hold records kept in storage.

Appendix A. DEFINITION OF TERMS (continued)

"Target" means markers filmed on a microfilm roll that serve to identify documents to be filmed, sectionalize the film for easier reference, certify the documents on film as true copies, or to determine resolution of the microfilm images.

"Transmittal of Records" means removal of records from office space and relocating them to warehouse space at the state records center.

"Updating" means adding recently microfilmed documents to previously microfilmed records.

"Vital Records" means those records that are essential for the operation and function, or reconstruction of a state agency. These are the records which require security storage or some means of protection.

POLICY: Information System Contingency Planning — Section 1-12601

STANDARD: #:
PROCEDURE: #:
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I. Policy

State agencies shall maintain contingency plans for all automated information processing systems and data centers.

A. Data centers include:

1. Departmental processors, i.e. network servers, minicomputers and mainframes.

2. mainframe processors managed by the Department of Administration's Information Services Division.

3. microcomputers installed within each agency.

B. A high priority must be placed on contingency planning for systems that support essential or critical services. Plans for these systems are necessary in order to provide reasonable assurance of service availability.

C. A list of prioritized systems for each data center must be maintained in order to identify the essential/critical applications that must be supported in the event that the data center's contingency plan is placed in operation.

D. The absence of a contingency plan for either the end user or the data center will jeopardize the ability to support the services provided by the automated system in the event of a disaster.

II. Background

Service continuity is a key factor in the efficient performance of agency functions. Contingency plans provide reasonable assurance that services can be continued in the event of a disruption to information processing resources. These plans are particularly important for those services that are identified as critical or essential to the agency.

III. Definitions

There are numerous definitions relating to contingency planning. The most frequently used terms are defined in alphabetic order in Appendix A.

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|---|---|---|---|
| POLICY: | Information System Contingency Planning | Section | 1-12601 |
| STANDARD: | Categorizing Automated Systems | #: | 01 |
| PROCEDURE: | | #: | |
| GUIDELINE: | | #: | |
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I. Prioritizing Information Systems

The Information Services Division working with the Data Processing Advisory Council shall establish and maintain a prioritized list of application categories for those systems utilizing mainframes managed by ISD.

A. This list will be used by State agencies to classify applications.

B. Agencies must inform ISD of the applications that are classified in each category.

C. The Information Services Division will use the agency lists as a basis for allocating resources in the event of a disaster which impacts central computing services.

The current priority categories are available in **Appendix B.** PRIORITIZING INFORMATION SYSTEMS.

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| POLICY: | Information System Contingency Planning | Section | 1-12601 |
| STANDARD: | End User Responsibilities | #: | 02 |
| PROCEDURE: | | #: | |
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I. End User Contingency Planning

End Users shall develop, document and test plans to ensure that agency services that rely on automated systems can be managed during a period when the supporting data center is out of service.

II. Scope of Responsibility

A. Develop contingency plans for all systems residing on:

1. Departmental processors, i.e. network servers, minicomputers and mainframes.

2. mainframe processors managed by the Department of Administration's Information Services Division.

3. microcomputers installed within the agency.

B. Ensure that all system (operations and user) documentation for the automated system is current and that copies of it are included with the contingency plan for the system.

C. Ensure that all data and other required resources are backed up and stored off-site.

D. Store current copies of all contingency plans in a secure off-site location.

E. Identify the Priority Categories that best fit each system. Use **Appendix B.** PRIORITIZING INFORMATION SYSTEMS to assist in this identification.

F. Inform the appropriate data center management of the priority systems.

G. Arrange for system tests, including system portability, using the data center's contingency plans.

III. Contingency Plan Maintenance

Reliable contingency plans require periodic attention to ensure their usefulness. This maintenance includes:

A. Updating the contingency plan when routine operational procedures change.

B. Providing awareness training for personnel who would be expected to participate in executing the contingency plan in the event of a data center service outage.

C. Periodic testing of alternate processing arrangements to verify their adequacy.

D. Periodic testing of system portability in cooperation with the host data center. This tests both the end user and data center contingency plans.

E. Periodic verification of recovery materials stored off-site. This includes data, software, system documentation and supplies.

F. Assigning responsibility for contingency plan maintenance.

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|---|---|---|---|
| POLICY: | Information System Contingency Planning | Section | 1-12601 |
| STANDARD: | End User Responsibilities | #: | 02 |
| PROCEDURE: | | #: | |
| GUIDELINE: | Contingency Plan Considerations | #: | 01 |
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I. Introduction

Contingency plans are to provide guidance for agency personnel in the event that the automated system suffers a temporary loss of service or an extended loss due to a major disaster. This guidance should enable the agency to provide service continuity until the automated system can be restored to its normal activity.

II. Identifying Essential/Critical Applications

Each automated system should be evaluated to identify how essential the system is to the agency. All systems need contingency plans and those whose loss of service would seriously impact the agency should be among the first to be covered by such a plan. Use the information obtained from this evaluation to prioritize the systems.

As an aid for identifying essential automated systems consider:

A. How long the system could be unavailable before impacting agency services. Use specific time frames such as 1 hour, 1 day, 1 week, 1 month, 3 months.

B. The impact of a data entry backlog. What would happen if the outage occurred during a period of time when large amounts of data is received for processing.

C. The number of agency personnel who would be unable to perform their tasks during the service outage.

D. The need to respond to inquiries from other State agencies, Federal agencies, businesses or the public.

E. The impact on agency revenue collections or payments.

F. The impact on meeting any statutory requirements for the agency.

III. End User Contingency Plan Outline

A. Identify the system or application by name with a brief description of its function.

B. Specify where the application software resides, i.e. what computer hardware or data center is involved.

C. Identify agency personnel who should be contacted in the event of a service disruption.

D. Identify the acceptable outage period before the contingency plan is to be placed in action.

E. Describe in detail the alternate manual (clerical) procedures to be followed during the outage period.

F. Describe in detail any system (operations and user) procedures to be used if the system can be moved to alternate hardware or an alternate data center.

G. Describe in detail the steps that will need to be taken in order to recover the system to its normal state once service is restored.

I. Data Center Contingency Planning

Data center managers shall develop and document contingency plans to ensure that essential or critical information processing services provided at the site can be supported in the event of a service disruption.

II. Scope of Responsibility

The data center shall:

A. Develop and distribute system portability guidelines to all data center users.

B. Maintain a list of all essential/critical systems served by the facility and prioritize them according to the list of critical application categories and the agency's priority. Refer to **Appendix B. PRIORITIZING INFORMATION SYSTEMS** for the list of critical application categories.

C. Develop contingency plans that address alternative procedures for maintaining information processing services for at least the highest priority systems in the event that the data center is out of service. Data centers include:

1. Departmental processors, i.e. network servers, minicomputers and mainframes.

2. mainframe processors managed by the Department of Administration's Information Services Division.

3. microcomputers installed within the agency.

D. Store current copies of all contingency plans and the list of critical applications in a secure off-site location.

III. Contingency Plan Maintenance

Reliable contingency plans require periodic attention to ensure their usefulness. This maintenance includes:

A. Assigning responsibility for contingency plan maintenance.

B. Updating the contingency plan when routine operational procedures change.

C. Updating the contingency plan when hardware changes are made.

D. Periodic testing of alternate processing arrangements to verify their adequacy.

E. Providing awareness training for personnel who would be expected to participate in executing the contingency plan in the event of a data center service outage.

F. Periodic verification of recovery materials stored off-site. This includes data, software, system documentation and supplies.

I. Introduction

Contingency plans are to provide guidance for data center personnel in the event that the data center suffers a temporary loss of service or an extended loss due to a major disaster. This guidance should enable the data center to provide service continuity for the essential/critical systems until the facility can be restored to its normal level of service.

II. Objectives of the Data Center Contingency Plan

The data center's contingency plan for the computer facility should include:

A. Identification of a viable backup computer facility for the restoration of essential State agency services.

B. A description of the resources available at the backup computer facility.

C. Emergency response procedures to support the continuity of essential State agency services.

D. Specifications and general procedures for establishing and testing portable systems.

E. Examples of proper contingency documentation for automated systems.

F. Provisions to make data center personnel and processing resources available to assist agency personnel with scheduled tests of critical automated systems including the portability of those systems.

G. Provisions for operational support at the backup computer facility for critical information systems in the event the data center is unavailable.

III. Identifying Potential Causes for Loss of Service

The following items should be considered when developing a Contingency Plan for data centers. It is advisable to consider each topic and prepare a contingency plan for each computer hardware site.

A. **EMERGENCY SITUATIONS**

1. High Temperature Condition
2. Power Outage
3. Fire and/or Smoke
4. Uncontrolled Water at the Computer Site
5. Earthquake
6. Tornado or Extremely High Winds
7. Bomb Threat
8. Riot or Civil Disturbance
9. Other

B. **COMPONENT FAILURE**

1. Microcomputers
2. Departmental Processors, i.e. Network Servers, Minicomputers or Mainframe Computer Systems
3. Communications Controllers
4. Local Area Network
5. State Telecommunications Network
6. Peripheral Devices (keyboards, monitors, printers, backup tape units, etc.)
7. Environmental Support Equipment (heating, cooling, air conditioning, etc.)

IV. Data Center Contingency Plan Outline

The data center contingency plan should separately address each of the potential causes for loss of service listed in Section III of this guideline. The following points should be considered when developing and maintaining the plan.

A. Describe the emergency response procedures to be followed in each case. Identify:

1. Specific actions that need to be taken immediately.
2. Emergency services, i.e. fire or police, that should be contacted.
3. Agency personnel who should be contacted.

B. Describe how to prepare a damage assessment report detailing the sequence of events leading up to the loss of service.

C. Estimate the length of outage for data center services and, based on this estimate, identify the appropriate action to be taken. Actions that may be considered are:

1. No action except to wait for service to be restored.
2. Move the operation to an alternate site, i.e.:
   a. a local data center.
   b. an established cold site.
   c. an established hot site.

D. If alternate site processing is selected be sure that instructions identifying the following are available.

1. Management and operational responsibilities.
   a. Management personnel and calling list.
   b. Operations personnel and calling list.
2. Transition and start up procedures
3. Data center application/system priorities.
4. Procedures for obtaining data center supplies, necessary files and other processing needs.
5. Data file restoration procedures.
6. Computer application support personnel.
7. Procedures for establishing on-line access.
8. Backup procedures including off-site storage.
9. Report distribution.

IV. Data Center Contingency Plan Outline (continued)

E. Describe the site/service restoration and the service vendors that may be needed based upon the Damage Assessment Report. Include:

1. Recovery administrative team identification.
2. Disaster declaration and required notifications.
3. Restoration procedures including vendors.
   a. Facility repair/replacement.
   b. Equipment repair/replacement.
4. Media expenses.
5. Other expenses.

F. Describe what will need to be done to return the data center to normal processing. Include identifying:

1. The recovery operations team.
2. Service recovery procedures for all affected services.
2. Data file restoration procedures. Include any file updating required to make the data current.
3. Computer application support.
4. Procedure for restoring on-line access.
5. Procedure for re-establishing report distribution.

G. Other considerations include:

1. Damage Assessment Forms.
2. Calling Lists - Employees and Users.
3. Vendor/Resource Contracts.
4. Disaster Recovery Logs.
5. Equipment inventories for all affected sites. Include environmental support equipment as well as computers and peripherals.
6. Floor plans for all affected sites.
7. Power requirements.
8. Environmental requirements.
9. Software licenses.
10. Production processing schedules.
11. Off-site supply inventories.
12. Contingency plan contracts.
13. Change notices.

## Appendix A. DEFINITION OF TERMS

The following are definitions of some of the more common terms used in contingency planning:

"Affects" means indirectly or intangibly causes an effect in time of crisis.

"Application Risk Assessment" means the formal process of evaluating the vulnerability of information technology resources, estimating the costs of potential losses, identifying alternative means of removing or limiting the risks.

"Contingency Plan" means a collection of plans, procedures, arrangements and information which are completed, compiled and held in readiness for use in the event of disruption of normal activities.

"Critical Application" means an information processing application supporting an essential function which fits at least one of the following criteria:

1. Processing of the application is required for continuity of essential functions in the event of a disaster.

2. If the application were handled manually, the resulting backlog of processing could not be recovered in a reasonable time after restoration, given the information resource capacity available.

"Crucial" means important or essential in time of crisis.

"Data and Information Technology Resources" means data processing mainframe, microcomputer hardware, peripherals, software, special forms, personnel, facility resources, maintenance, training, electronically stored data, or other related resources.

"Data Center" means any computer device including:

1. Departmental processors, i.e. network servers, minicomputers and mainframes.

2. mainframe processors managed by the Department of Administration's Information Services Division.

3. microcomputers installed within the agency.

"Disaster Recovery Plans" means plans established to respond to disruptions resulting in prolonged unavailability of information assets such that it interferes with the State's ability to deliver essential services.

"Emergency Response Procedures" means procedures established for immediate response to any actual or impending situation that can cause injury, loss of life, destruction of property or interference with normal activity such that information assets will be rendered partially or totally inoperable or unavailable.

"Essential Function" means any function supporting a major State of Montana cash flow mechanism or an essential service required to maintain operation of the State government during a sustained loss of information resources of as much as three months duration.

"Information Processing Center" means any computer that is used to store data, produce reports, support work stations, and/or communicate with a host computer or other computers.

"Portable System" means that the application software is designed in such a manner that it can function using the resources which are available at the designated backup computer facility.

## Appendix B. PRIORITIZING INFORMATION SYSTEMS

The following priority categories have been established to assist in identifying information systems that are critical to maintaining State agency services in the event of a disruption in computer services. Agencies are responsible for informing their computer service Data Center of the priority category that best applies to each of their application sets.

Applications are to be classified in one of the following priority categories which are listed in order from the most critical to the least:

| PRIORITY | PRIORITY CATEGORY |
|---|---|
| 1. | Crucial to Public Safety and Health |
| 2. | Crucial to Payment of Vital Obligations |
| 3. | Crucial to Generation of Vital Revenue |
| 4. | Crucial to Operation of State Government |
| 5. | Affects Public Safety and Health |
| 6. | Crucial to Satisfaction of State Legislative Mandates |
| 7. | Crucial to Non-critical Public Services |
| 8. | Crucial to Satisfaction of Federal Legislative Mandates |
| 9. | Affects Payment of Obligations |
| 10. | Affects Operation of State Government |
| 11. | Affects Generation of Revenues |
| 12. | Affects Satisfaction of State Legislative Mandates |
| 13. | Affects Satisfaction of Federal Legislative Mandates |
| 14. | Affects Non-Critical Public Services |

POLICY: Security of Data and Information Technology Resources — Section 1-12602

STANDARD: #:
PROCEDURE: #:
GUIDELINE: #:

PUB. DATE: 09/21/89
REVIEW DATE:


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I. Policy

In order to ensure the adequate protection of the State's data and information technology resources:

A. the Department of Administration shall provide centralized management and coordination of State policies for security of data and information technology resources.

B. each department head shall assure an adequate level of security for all data and information technology resources within their department.

II. Authorization

The Department of Administration and the other departments of State government have been directed by the Legislature to provide an adequate level of security for data and information technology resources within their respective departments (Sections 2-17-503 and 2-15-114, MCA).

III. Definitions

A. "Data and Information Technology Resources" means data processing mainframe, microcomputer hardware, peripherals, software, special forms, personnel facility resources, maintenance, training, electronically stored data, or other related resources.

B. "Production Data Sets" are computer files that contain information that directly or indirectly affects the ongoing operation of the agency. This includes both data maintained by application systems and administrative support systems (word processing files, spreadsheets, automated calendars, etc.) on ISD's mainframes and/or departmental microcomputers and other processors. Although the loss of computer files created to test, demonstrate, or evaluate systems may impact agency operations they are not considered production data sets for the purposes of this policy.

| | | | |
|---|---|---|---|
| POLICY: | Security of Data and Information Technology Resources | Section | 1-12602 |
| STANDARD: | Information Access Control | #: | 01 |
| PROCEDURE: | | #: | |
| GUIDELINE: | | #: | |
| | | PUB. DATE: | 09/21/89 |
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| | | PAGE: | 1 OF 1 |

I. Controlling Access to Data and Information Technology Resources

In order to ensure the adequate protection of the State's data and information technology resources through active management of access control procedures each State agency will:

A. be responsible for controlling access to data and information technology resources owned or managed by the agency.

B. designate at least two agency employees as the agency's Security Officer and alternate agency Security Officer whose responsibilities will be to ensure that only authorized users will have access to the agency's data and information technology resources.

II. Mainframe Access Control

Mainframe access control to data and information technology resources will be performed by agency Security Officers through the use of a software tool called Access Control Facility-2 (ACF2). Control will be exercised by:

A. identifying to the Department of Administration's Central Security Officer those users authorized to access agency data and information stored on the Department of Administration's mainframe computer.

B. writing ACF2 rules which will control the level of access to the agency's data and information stored on the Department of Administration's mainframe computer.

| | | | |
|---|---|---|---|
| POLICY: | Security of Data and Information Technology Resources | Section | 1-12602 |
| STANDARD: | Information Access Control | #: | 01 |
| PROCEDURE: | Recognition and Training of Agency Security Officers | #: | 01 |
| GUIDELINE: | | #: | |
| | | PUB. DATE: | 09/21/89 |
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I. Identification of Agency Security Officers

A. The Department of Administration's Central Security Officer will acknowledge an agency's Security Officer and alternate Security Officer upon receipt of a letter or letters identifying these individuals.

B. Letters must be on agency letterhead stationary and signed by the appropriate agency management.

II. ACF2 Training

The Department of Administration's Central Security Officer will make ACF2 training available to each designated agency Security Officer and alternate. The effectiveness of agency Security Officers can be substantially increased through specialized training in the use of ACF2 security software.

A. The Department of Administration recommends that all agency Security Officers receive this training before attempting to write the ACF2 rules for controlling user access to agency data and information.

B. Individual or group instruction is available to all agency Security Officers and provided on request from the Department of Administration's Central Security Officer.

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|---|---|---|---|
| POLICY: | Security of Data and Information Technology Resources | Section | 1-12602 |
| STANDARD: | Information Access Control | #: | 01 |
| PROCEDURE: | Controlling Access to Agency Data and Information | #: | 02 |
| GUIDELINE: | | #: | |
| | | PUB. DATE: | 09/21/89 |
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| | | PAGE: | 1 OF 2 |

I. Controlling Access to Agency Data and Information

Agency Security Officers are responsible for maintaining control over user access to production datasets of agency data and information. Agency Security Officers will:

A. Write the necessary ACF2 rules to authorize user access to agency data and information. These rules will specify the level of access authority for each user.

B. Maintain a list of authorized users and the level of privileges assigned to each.

D. Regularly review ACF2 reports to detect any security violations or unauthorized access attempts.

E. Research suspected access attempts and report any confirmed security violations to the Department of Administration's Central Security Officer.

F. Promptly notify the Department of Administration's Central Security Officer of the termination of any employees who are ACF2 authorized users.

II. Controlling Unauthorized Access to Production Datasets

A. The Department of Administration's Central Security Officer will prohibit unauthorized access to production datasets unless the agency Security Officer specifies rules to the contrary.

B. In order to control unauthorized use of mainframe log-on identification numbers, the Department of Administration's Central Security Officer will:

1. maintain a list of authorized dataset prefixes.

2. periodically review log-on identification number activity and suspend those log-on identification numbers not used within the past 90 days.

3. suspend log-on identification numbers of terminated employees.

4. restrict the reassignment of log-on identification numbers.

| | | | |
|---|---|---|---|
| POLICY: | Security of Data and Information Technology Resources | Section | 1-12602 |
| STANDARD: | Information Access Control | #: | 01 |
| PROCEDURE: | Controlling Access to Agency Data and Information | #: | 02 |
| GUIDELINE: | Controlling Access to Databases and Sensitive Information | #: | 01 |
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I. Controlling Access to Databases and Sensitive Information

The Department of Administration recommends that:

A. agencies evaluate the access risks and security requirements for data and systems owned or managed by the agency.

B. the security features of the data base management system should be employed according to the system's security requirements if the system is a database controlled by IDMS.

C. all the security features of the teleprocessing monitor should be used to restrict access only to authorized individuals for all systems that provide on-line access.

D. custom security techniques should be developed to supplement additional controls if information is financial or sensitive in nature.

E. custom security systems should encrypt user sign-ons if the disclosure risk is high.

| | | | |
|---|---|---|---|
| POLICY: | Control of Mainframe Software | Section #: | 1-12604 |
| STANDARD: | | #: | |
| PROCEDURE: | | #: | |
| GUIDELINE: | | #: | |
| | | PUB. DATE: | 09/21/89 |
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I. Policy

Software residing on mainframes operated or managed by the Department of Administration's Information Services Division will be controlled to minimize the possibility of unauthorized access, processing errors, manipulation, misuse, and intentional or accidental loss of data.

II. Definitions

There are numerous terms relating to mainframe software. The most frequently used terms are defined in alphabetic order in Appendix A.

## Appendix A. DEFINITION OF TERMS

The following are definitions of some commonly used terms in the computer processing field:

(RESERVED FOR FUTURE USE)